

# PS1 Database observational metadata tables

This page describes the contents of the PanSTARRS-1 observational metadata database tables. These tables include information on the observations that contributed to the PS1 survey, including observation date, exposure time, filter, seeing, etc. Other tables include information on secondary data products such as the list of images that contribute to stacks. The information is not specific to individual objects but may be useful in understanding the images and catalogs. The descriptions are extracted from the PSPS Schema Browser interface created by the University of Hawaii.

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## Tables included in DR1

### StackToImage

**Description:** Contains the mapping of which input images were used to construct a particular stack.

| Name                | Unit          | Data Type | Size | Default Value | Description                                                      |
|---------------------|---------------|-----------|------|---------------|------------------------------------------------------------------|
| <b>stackImageID</b> | dimensionless | BIGINT    | 8    | NA            | Unique stack identifier.                                         |
| <b>imageID</b>      | dimensionless | BIGINT    | 8    | NA            | Unique image identifier. Constructed as (100 * frameID + ccdID). |

### StackToFrame

**Description:** Contains the mapping of input frames used to construct a particular stack along with processing stats.

| Name                | Unit          | Data Type | Size | Default Value | Description                                                                                                             |
|---------------------|---------------|-----------|------|---------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>stackImageID</b> | dimensionless | BIGINT    | 8    | NA            | Unique stack identifier.                                                                                                |
| <b>frameID</b>      | dimensionless | INT       | 4    | NA            | Unique frame/exposure identifier.                                                                                       |
| <b>scaleFactor</b>  | dimensionless | REAL      | 4    | 0             | normalization factor applied to input image before stacking.                                                            |
| <b>zp</b>           | magnitudes    | REAL      | 4    | 0             | Photometric zeropoint. Necessary for converting listed fluxes and magnitudes back to measured ADU counts.               |
| <b>expTime</b>      | seconds       | REAL      | 4    | -999          | Exposure time of the frame/exposure. Necessary for converting listed fluxes and magnitudes back to measured ADU counts. |

|         |               |      |   |   |                                                                                                                         |
|---------|---------------|------|---|---|-------------------------------------------------------------------------------------------------------------------------|
| airMass | dimensionless | REAL | 4 | 0 | Airmass at midpoint of the exposure. Necessary for converting listed fluxes and magnitudes back to measured ADU counts. |
|---------|---------------|------|---|---|-------------------------------------------------------------------------------------------------------------------------|

## StackMeta

**Description: Contains the metadata describing the stacked image produced from the combination of a set of single epoch exposures. The nature of the stack is given by the StackTypeID. The astrometric and photometric calibration of the stacked image are listed.**

| Name               | Unit          | Data Type    | Size | Default Value | Description                                                                                                                                      |
|--------------------|---------------|--------------|------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| stackImageID       | dimensionless | BIGINT       | 8    | NA            | Unique stack identifier.                                                                                                                         |
| batchID            | dimensionless | BIGINT       | 8    | NA            | Internal database batch identifier.                                                                                                              |
| surveyID           | dimensionless | TINYINT      | 1    | NA            | Survey identifier. Details in the Survey table.                                                                                                  |
| filterID           | dimensionless | TINYINT      | 1    | NA            | Filter identifier. Details in the Filter table.                                                                                                  |
| stackTypeID        | dimensionless | TINYINT      | 1    | 0             | Stack type identifier. Details in the StackType table.                                                                                           |
| tessID             | dimensionless | TINYINT      | 1    | 0             | Tessellation identifier. Details in the TessellationType table.                                                                                  |
| projectionID       | dimensionless | SMALLINT     | 2    | -1            | Projection cell identifier.                                                                                                                      |
| skyCellID          | dimensionless | TINYINT      | 1    | 255           | Skycell region identifier.                                                                                                                       |
| photoCalID         | dimensionless | INT          | 4    | NA            | Photometric calibration identifier. Details in the PhotoCal table.                                                                               |
| analysisVer        | dimensionless | VARCHAR(100) | 100  |               | IPP software analysis release version.                                                                                                           |
| md5sum             | dimensionless | VARCHAR(100) | 100  |               | IPP MD5 Checksum.                                                                                                                                |
| expTime            | seconds       | REAL         | 4    | -999          | Exposure time of the stack. Necessary for converting listed fluxes and magnitudes back to measured ADU counts.                                   |
| nP2Images          | dimensionless | SMALLINT     | 2    | -999          | Number of input exposures/frames contributing to this stack.                                                                                     |
| detectionThreshold | magnitudes    | REAL         | 4    | -999          | Reference magnitude for detection efficiency calculation.                                                                                        |
| astroScat          | dimensionless | REAL         | 4    | -999          | Measurement of the calibration (not astrometric error) defined to be the sum in quadrature of the standard deviations in the X and Y directions. |
| photoScat          | dimensionless | REAL         | 4    | -999          | Photometric scatter relative to reference catalog.                                                                                               |
| nAstroRef          | dimensionless | INT          | 4    | -999          | Number of astrometric reference sources.                                                                                                         |
| nPhotoRef          | dimensionless | INT          | 4    | -999          | Number of photometric reference sources.                                                                                                         |
| recalAstroScatX    | arcsec        | REAL         | 4    | -999          | Measurement of the re-calibration (not astrometric error) in the X direction.                                                                    |
| recalAstroScatY    | arcsec        | REAL         | 4    | -999          | Measurement of the re-calibration (not astrometric error) in the Y direction.                                                                    |
| recalNAstroStars   | dimensionless | INT          | 4    | -999          | Number of astrometric reference sources used in recalibration.                                                                                   |
| recalphotoScat     | magnitudes    | REAL         | 4    | -999          | Photometric scatter relative to reference catalog.                                                                                               |
| recalNPphotoStars  | dimensionless | INT          | 4    | -999          | Number of astrometric reference sources used in recalibration.                                                                                   |

|                          |               |              |     |      |                                                                                 |
|--------------------------|---------------|--------------|-----|------|---------------------------------------------------------------------------------|
| <b>psfModeID</b>         | dimensionless | INT          | 4   | -999 | PSF model identifier.                                                           |
| <b>psfFWHM</b>           | arcsec        | REAL         | 4   | -999 | Mean PSF full width at half maximum at image center.                            |
| <b>psfWidMajor</b>       | arcsec        | REAL         | 4   | -999 | PSF major axis FWHM at image center.                                            |
| <b>psfWidMinor</b>       | arcsec        | REAL         | 4   | -999 | PSF minor axis FWHM at image center.                                            |
| <b>psfTheta</b>          | degrees       | REAL         | 4   | -999 | PSF major axis orientation at image center.                                     |
| <b>photoZero</b>         | magnitudes    | REAL         | 4   | -999 | Locally derived photometric zero point for this stack.                          |
| <b>ctype1</b>            | dimensionless | VARCHAR(100) | 100 |      | Name of astrometric projection in right ascension.                              |
| <b>ctype2</b>            | dimensionless | VARCHAR(100) | 100 |      | Name of astrometric projection in declination.                                  |
| <b>crval1</b>            | degrees       | FLOAT        | 8   | -999 | Right ascension corresponding to reference pixel.                               |
| <b>crval2</b>            | degrees       | FLOAT        | 8   | -999 | Declination corresponding to reference pixel.                                   |
| <b>crpix1</b>            | sky pixels    | FLOAT        | 8   | -999 | Reference pixel for right ascension.                                            |
| <b>crpix2</b>            | sky pixels    | FLOAT        | 8   | -999 | Reference pixel for declination.                                                |
| <b>cdelt1</b>            | degrees/pixel | FLOAT        | 8   | -999 | Pixel scale in right ascension.                                                 |
| <b>cdelt2</b>            | degrees/pixel | FLOAT        | 8   | -999 | Pixel scale in declination.                                                     |
| <b>pc001001</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and right ascension. |
| <b>pc001002</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel y and right ascension. |
| <b>pc002001</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and declination.     |
| <b>pc002002</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel y and declination.     |
| <b>processingVersion</b> | dimensionless | TINYINT      | 1   | NA   | Data release version.                                                           |

## StackDetEffMeta

**Description: Contains the detection efficiency information for a given stacked image. Provides the number of recovered sources out of 500 injected sources for each magnitude bin and statistics about the magnitudes of the recovered sources for a range of magnitude offsets.**

| Name                | Unit          | Data Type | Size | Default Value | Description                                                                |
|---------------------|---------------|-----------|------|---------------|----------------------------------------------------------------------------|
| <b>stackImageID</b> | dimensionless | BIGINT    | 8    | NA            | Unique stack identifier.                                                   |
| <b>magref</b>       | magnitudes    | REAL      | 4    | NA            | Detection efficiency reference magnitude.                                  |
| <b>nInjected</b>    | dimensionless | INT       | 4    | NA            | Number of fake sources injected in each magnitude bin.                     |
| <b>offset01</b>     | magnitudes    | REAL      | 4    | NA            | Detection efficiency magnitude offset for bin 1.                           |
| <b>counts01</b>     | dimensionless | REAL      | 4    | NA            | Detection efficiency count of recovered sources in bin 1.                  |
| <b>diffMean01</b>   | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude difference in bin 1.                   |
| <b>diffStdev01</b>  | magnitudes    | REAL      | 4    | NA            | Detection efficiency standard deviation of magnitude differences in bin 1. |

|                    |               |      |   |    |                                                                            |
|--------------------|---------------|------|---|----|----------------------------------------------------------------------------|
| <b>errMean01</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 1.                        |
| <b>offset02</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 2.                           |
| <b>counts02</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 2.                  |
| <b>diffMean02</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 2.                   |
| <b>diffStdev02</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 2. |
| <b>errMean02</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 2.                        |
| <b>offset03</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 3.                           |
| <b>counts03</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 3.                  |
| <b>diffMean03</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 3.                   |
| <b>diffStdev03</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 3. |
| <b>errMean03</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 3.                        |
| <b>offset04</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 4.                           |
| <b>counts04</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 4.                  |
| <b>diffMean04</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 4.                   |
| <b>diffStdev04</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 4. |
| <b>errMean04</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 4.                        |
| <b>offset05</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 5.                           |
| <b>counts05</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 5.                  |
| <b>diffMean05</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 5.                   |
| <b>diffStdev05</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 5. |
| <b>errMean05</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 5.                        |
| <b>offset06</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 6.                           |
| <b>counts06</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 6.                  |
| <b>diffMean06</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 6.                   |
| <b>diffStdev06</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 6. |
| <b>errMean06</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 6.                        |
| <b>offset07</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 7.                           |
| <b>counts07</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 7.                  |
| <b>diffMean07</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 7.                   |
| <b>diffStdev07</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 7. |

|                    |               |      |   |    |                                                                             |
|--------------------|---------------|------|---|----|-----------------------------------------------------------------------------|
| <b>errMean07</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 7.                         |
| <b>offset08</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 8.                            |
| <b>counts08</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 8.                   |
| <b>diffMean08</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 8.                    |
| <b>diffStdev08</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 8.  |
| <b>errMean08</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 8.                         |
| <b>offset09</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 9.                            |
| <b>counts09</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 9.                   |
| <b>diffMean09</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 9.                    |
| <b>diffStdev09</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 9.  |
| <b>errMean09</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 9.                         |
| <b>offset10</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 10.                           |
| <b>counts10</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 10.                  |
| <b>diffMean10</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 10.                   |
| <b>diffStdev10</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 10. |
| <b>errMean10</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 10.                        |
| <b>offset11</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 11.                           |
| <b>counts11</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 11.                  |
| <b>diffMean11</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 11.                   |
| <b>diffStdev11</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 11. |
| <b>errMean11</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 11.                        |
| <b>offset12</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 12.                           |
| <b>counts12</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 12.                  |
| <b>diffMean12</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 12.                   |
| <b>diffStdev12</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 12. |
| <b>errMean12</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 12.                        |
| <b>offset13</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 13.                           |
| <b>counts13</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 13.                  |
| <b>diffMean13</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 13.                   |
| <b>diffStdev13</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 13. |

|           |            |      |   |    |                                                      |
|-----------|------------|------|---|----|------------------------------------------------------|
| errMean13 | magnitudes | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 13. |
|-----------|------------|------|---|----|------------------------------------------------------|

## Tables not included in DR1

The tables below are not part of the DR1 database, but their descriptions are included for completeness.

### FrameMeta

**Description:** Contains metadata related to an individual exposure. A "Frame" refers to the collection of all images obtained by the 60 OTA devices in the camera in a single exposure. The camera configuration, telescope pointing, observation time, and astrometric solution from the detector focal plane (L,M) to the sky (RA,Dec) is provided.

| Name           | Unit          | Data Type    | Size | Default Value | Description                                                                                                             |
|----------------|---------------|--------------|------|---------------|-------------------------------------------------------------------------------------------------------------------------|
| frameID        | dimensionless | INT          | 4    | NA            | Unique frame/exposure identifier.                                                                                       |
| frameName      | dimensionless | VARCHAR(32)  | 32   | NA            | Frame/exposure name provided by the camera software.                                                                    |
| surveyID       | dimensionless | TINYINT      | 1    | NA            | Survey identifier. Details in the <a href="#">Survey</a> table.                                                         |
| filterID       | dimensionless | TINYINT      | 1    | NA            | Filter identifier. Details in the <a href="#">Filter</a> table.                                                         |
| ippChipID      | dimensionless | INT          | 4    | NA            | IPP chipRun identifier.                                                                                                 |
| ippCamID       | dimensionless | INT          | 4    | NA            | IPP camRun identifier.                                                                                                  |
| ippWarpID      | dimensionless | INT          | 4    | NA            | IPP warpRun identifier.                                                                                                 |
| cameraID       | dimensionless | SMALLINT     | 2    | NA            | Camera identifier. Details in the CameraConfig table.                                                                   |
| cameraConfigID | dimensionless | SMALLINT     | 2    | NA            | Camera configuration identifier. Details in the CameraConfig table.                                                     |
| telescopeID    | dimensionless | SMALLINT     | 2    | NA            | Telescope identifier.                                                                                                   |
| analysisVer    | dimensionless | VARCHAR(100) | 100  |               | IPP software analysis release version.                                                                                  |
| md5sum         | dimensionless | VARCHAR(100) | 100  |               | IPP MD5 Checksum.                                                                                                       |
| nOTA           | dimensionless | SMALLINT     | 2    | -999          | Number of valid OTA images in this frame/exposure.                                                                      |
| photoScat      | magnitudes    | REAL         | 4    | -999          | Photometric scatter relative to reference catalog across the full field of view.                                        |
| nPhotoRef      | dimensionless | INT          | 4    | -999          | Number of photometric reference sources.                                                                                |
| expStart       | days          | FLOAT        | 8    | -999          | Modified Julian Date at the start of the exposure.                                                                      |
| expTime        | seconds       | REAL         | 4    | -999          | Exposure time of the frame/exposure. Necessary for converting listed fluxes and magnitudes back to measured ADU counts. |
| airmass        | dimensionless | REAL         | 4    | 0             | Airmass at midpoint of the exposure. Necessary for converting listed fluxes and magnitudes back to measured ADU counts. |
| raBore         | degrees       | FLOAT        | 8    | -999          | Right ascension of telescope boresight.                                                                                 |
| decBore        | degrees       | FLOAT        | 8    | -999          | Declination of telescope boresight.                                                                                     |
| ctype1         | dimensionless | VARCHAR(100) | 100  |               | Name of astrometric projection in right ascension.                                                                      |

|                          |                    |              |     |      |                                                                                             |
|--------------------------|--------------------|--------------|-----|------|---------------------------------------------------------------------------------------------|
| <b>ctype2</b>            | dimensionless      | VARCHAR(100) | 100 |      | Name of astrometric projection in declination.                                              |
| <b>crval1</b>            | degrees            | FLOAT        | 8   | -999 | Right ascension corresponding to reference pixel.                                           |
| <b>crval2</b>            | degrees            | FLOAT        | 8   | -999 | Declination corresponding to reference pixel.                                               |
| <b>crpix1</b>            | focal plane pixels | FLOAT        | 8   | -999 | Reference pixel for right ascension.                                                        |
| <b>crpix2</b>            | focal plane pixels | FLOAT        | 8   | -999 | Reference pixel for declination.                                                            |
| <b>cdelt1</b>            | degrees/pixel      | FLOAT        | 8   | -999 | Pixel scale in right ascension.                                                             |
| <b>cdelt2</b>            | degrees/pixel      | FLOAT        | 8   | -999 | Pixel scale in declination.                                                                 |
| <b>pc001001</b>          | dimensionless      | FLOAT        | 8   | -999 | Linear transformation matrix element between focal plane pixel L and right ascension.       |
| <b>pc001002</b>          | dimensionless      | FLOAT        | 8   | -999 | Linear transformation matrix element between focal plane pixel M and right ascension.       |
| <b>pc002001</b>          | dimensionless      | FLOAT        | 8   | -999 | Linear transformation matrix element between focal plane pixel L and declination.           |
| <b>pc002002</b>          | dimensionless      | FLOAT        | 8   | -999 | Linear transformation matrix element between focal plane pixel M and declination.           |
| <b>polyOrder</b>         | dimensionless      | TINYINT      | 1   | 255  | Polynomial order of astrometric fit between the detector focal plane and the sky.           |
| <b>pca1x3y0</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^3 y^0$ ) for right ascension. |
| <b>pca1x2y1</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^1$ ) for right ascension. |
| <b>pca1x1y2</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^2$ ) for right ascension. |
| <b>pca1x0y3</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^3$ ) for right ascension. |
| <b>pca1x2y0</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^0$ ) for right ascension. |
| <b>pca1x1y1</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^1$ ) for right ascension. |
| <b>pca1x0y2</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^2$ ) for right ascension. |
| <b>pca2x3y0</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^3 y^0$ ) for declination.     |
| <b>pca2x2y1</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^1$ ) for declination.     |
| <b>pca2x1y2</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^2$ ) for declination.     |
| <b>pca2x0y3</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^3$ ) for declination.     |
| <b>pca2x2y0</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^0$ ) for declination.     |
| <b>pca2x1y1</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^1$ ) for declination.     |
| <b>pca2x0y2</b>          | dimensionless      | FLOAT        | 8   | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^2$ ) for declination.     |
| <b>batchID</b>           | dimensionless      | BIGINT       | 8   | NA   | Internal database batch identifier.                                                         |
| <b>processingVersion</b> | dimensionless      | TINYINT      | 1   | NA   | Data release version.                                                                       |

## ImageMeta

**Description: Contains metadata related to an individual OTA image that comprises a portion of the full exposure. The characterization of the image quality, the detrends applied, and the astrometric solution from the raw pixels (X,Y) to the detector focal plane (L,M) is provided.**

| Name               | Unit                        | Data Type | Size | Default Value | Description                                                                                                                                      |
|--------------------|-----------------------------|-----------|------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| imageID            | dimensionless               | BIGINT    | 8    | NA            | Unique image identifier. Constructed as (100 * frameID + ccdID).                                                                                 |
| frameID            | dimensionless               | INT       | 4    | NA            | Unique frame/exposure identifier.                                                                                                                |
| ccdID              | dimensionless               | SMALLINT  | 2    | NA            | OTA identifier based on location in the focal plane, specific to an individual device.                                                           |
| photoCalID         | dimensionless               | INT       | 4    | NA            | Photometric calibration identifier. Details in the PhotoCal table.                                                                               |
| filterID           | dimensionless               | TINYINT   | 1    | NA            | Filter identifier. Details in the Filter table.                                                                                                  |
| bias               | adu                         | REAL      | 4    | -999          | OTA bias level.                                                                                                                                  |
| biasScat           | adu                         | REAL      | 4    | -999          | Scatter in bias level.                                                                                                                           |
| sky                | Janskys/arcsec <sup>2</sup> | REAL      | 4    | -999          | Mean sky brightness.                                                                                                                             |
| skyScat            | Janskys/arcsec <sup>2</sup> | REAL      | 4    | -999          | Scatter in mean sky brightness.                                                                                                                  |
| nDetect            | dimensionless               | INT       | 4    | -999          | Number of detections in this image.                                                                                                              |
| detectionThreshold | magnitudes                  | REAL      | 4    | -999          | Reference magnitude for detection efficiency calculation.                                                                                        |
| astroScat          | arcsec                      | REAL      | 4    | -999          | Measurement of the calibration (not astrometric error) defined to be the sum in quadrature of the standard deviations in the X and Y directions. |
| photoScat          | magnitudes                  | REAL      | 4    | -999          | Photometric scatter relative to reference catalog.                                                                                               |
| nAstroRef          | dimensionless               | INT       | 4    | -999          | Number of astrometric reference sources.                                                                                                         |
| nPhotoRef          | dimensionless               | INT       | 4    | -999          | Number of photometric reference sources.                                                                                                         |
| recalAstroScatX    | arcsec                      | REAL      | 4    | -999          | Measurement of the re-calibration (not astrometric error) in the X direction.                                                                    |
| recalAstroScatY    | arcsec                      | REAL      | 4    | -999          | Measurement of the re-calibration (not astrometric error) in the Y direction.                                                                    |
| recalNAstroStars   | dimensionless               | INT       | 4    | -999          | Number of astrometric reference sources used in recalibration.                                                                                   |
| recalphotoScat     | magnitudes                  | REAL      | 4    | -999          | Photometric scatter relative to reference catalog.                                                                                               |
| recalNPhotoStars   | dimensionless               | INT       | 4    | -999          | Number of astrometric reference sources used in recalibration.                                                                                   |
| nAxis1             | pixels                      | SMALLINT  | 2    | -999          | Image dimension in x.                                                                                                                            |
| nAxis2             | pixels                      | SMALLINT  | 2    | -999          | Image dimension in y.                                                                                                                            |
| psfModelID         | dimensionless               | INT       | 4    | -999          | PSF model identifier.                                                                                                                            |
| psfFWHM            | arcsec                      | REAL      | 4    | -999          | Mean PSF full width at half maximum at image center.                                                                                             |
| psfWidMajor        | arcsec                      | REAL      | 4    | -999          | PSF major axis FWHM at image center.                                                                                                             |
| psfWidMinor        | arcsec                      | REAL      | 4    | -999          | PSF minor axis FWHM at image center.                                                                                                             |
| psfTheta           | degrees                     | REAL      | 4    | -999          | PSF major axis orientation at image center.                                                                                                      |



|                     |                              |              |     |      |                                                                                                                                                                               |
|---------------------|------------------------------|--------------|-----|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>moment Major</b> | arcsec                       | REAL         | 4   | -999 | PSF major axis second moment.                                                                                                                                                 |
| <b>moment Minor</b> | arcsec                       | REAL         | 4   | -999 | PSF minor axis second moment.                                                                                                                                                 |
| <b>moment M2C</b>   | arcsec <sup>2</sup>          | REAL         | 4   | -999 | Moment M2C = M <sub>xx</sub> - M <sub>yy</sub> .                                                                                                                              |
| <b>moment M2S</b>   | arcsec <sup>2</sup>          | REAL         | 4   | -999 | Moment M2S = 2 * M <sub>xy</sub> .                                                                                                                                            |
| <b>moment M3</b>    | arcsec <sup>2</sup>          | REAL         | 4   | -999 | trefoil second moment = sqrt( (M <sub>xxx</sub> - 3 * M <sub>xyy</sub> ) <sup>2</sup> + (3 * M <sub>xyy</sub> - M <sub>yyy</sub> ) <sup>2</sup> ).                            |
| <b>moment M4</b>    | arcsec <sup>2</sup>          | REAL         | 4   | -999 | quadrupole second moment = sqrt( (M <sub>xxxx</sub> - 6 * M <sub>xyy</sub> + M <sub>yyy</sub> ) <sup>2</sup> + (4 * M <sub>xxx</sub> - 4 * M <sub>xyy</sub> ) <sup>2</sup> ). |
| <b>apResid</b>      | magnitudes                   | REAL         | 4   | -999 | Residual of aperture corrections.                                                                                                                                             |
| <b>dapResid</b>     | magnitudes                   | REAL         | 4   | -999 | Scatter of aperture corrections.                                                                                                                                              |
| <b>detector ID</b>  | dimensionless                | VARCHAR(100) | 100 |      | Identifier for each individual OTA detector device.                                                                                                                           |
| <b>qaFlags</b>      | dimensionless                | BIGINT       | 8   | -999 | Q/A flags for this image. Values listed in ImageFlags.                                                                                                                        |
| <b>detrend1</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 1, the static mask.                                                                                                                              |
| <b>detrend2</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 2, the dark model.                                                                                                                               |
| <b>detrend3</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 3, the flat.                                                                                                                                     |
| <b>detrend4</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 4, the fringe.                                                                                                                                   |
| <b>detrend5</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 5, the noisemap.                                                                                                                                 |
| <b>detrend6</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 6, the non-linearity correction.                                                                                                                 |
| <b>detrend7</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 7, the video dark model.                                                                                                                         |
| <b>detrend8</b>     | dimensionless                | VARCHAR(100) | 100 |      | Identifier for detrend image 8.                                                                                                                                               |
| <b>photoZero</b>    | magnitudes                   | REAL         | 4   | -999 | Locally derived photometric zero point for this image.                                                                                                                        |
| <b>ctype1</b>       | dimensionless                | VARCHAR(100) | 100 |      | Name of astrometric projection in focal plane L.                                                                                                                              |
| <b>ctype2</b>       | dimensionless                | VARCHAR(100) | 100 |      | Name of astrometric projection in focal plane M.                                                                                                                              |
| <b>crval1</b>       | focal plane pixels           | FLOAT        | 8   | -999 | Focal plane L corresponding to reference pixel.                                                                                                                               |
| <b>crval2</b>       | focal plane pixels           | FLOAT        | 8   | -999 | Focal plane M corresponding to reference pixel.                                                                                                                               |
| <b>crpix1</b>       | raw pixels                   | FLOAT        | 8   | -999 | Reference pixel for focal plane L.                                                                                                                                            |
| <b>crpix2</b>       | raw pixels                   | FLOAT        | 8   | -999 | Reference pixel for focal plane M.;                                                                                                                                           |
| <b>cdelt1</b>       | focal plane pixels/raw pixel | FLOAT        | 8   | -999 | Pixel scale in focal plane x.                                                                                                                                                 |
| <b>cdelt2</b>       | focal plane pixels/raw pixel | FLOAT        | 8   | -999 | Pixel scale in focal plane y.                                                                                                                                                 |
| <b>pc001001</b>     | dimensionless                | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and focal plane pixel L.                                                                                           |
| <b>pc001002</b>     | dimensionless                | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel y and focal plane pixel L.                                                                                           |
| <b>pc002001</b>     | dimensionless                | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and focal plane pixel M.                                                                                           |
| <b>pc002002</b>     | dimensionless                | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel y and focal plane pixel M.                                                                                           |

|                          |               |         |   |      |                                                                                            |
|--------------------------|---------------|---------|---|------|--------------------------------------------------------------------------------------------|
| <b>polyOrder</b>         | dimensionless | TINYINT | 1 | 255  | Polynomial order of astrometric fit between the image pixels and the detector focal plane. |
| <b>pca1x3y0</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^3 y^0$ ) for focal plane L.  |
| <b>pca1x2y1</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^1$ ) for focal plane L.  |
| <b>pca1x1y2</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^2$ ) for focal plane L.  |
| <b>pca1x0y3</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^3$ ) for focal plane L.  |
| <b>pca1x2y0</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^0$ ) for focal plane L.  |
| <b>pca1x1y1</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^1$ ) for focal plane L.  |
| <b>pca1x0y2</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^2$ ) for focal plane L.  |
| <b>pca2x3y0</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^3 y^0$ ) for focal plane M.  |
| <b>pca2x2y1</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^1$ ) for focal plane M.  |
| <b>pca2x1y2</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^2$ ) for focal plane M.  |
| <b>pca2x0y3</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^3$ ) for focal plane M.  |
| <b>pca2x2y0</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^2 y^0$ ) for focal plane M.  |
| <b>pca2x1y1</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^1 y^1$ ) for focal plane M.  |
| <b>pca2x0y2</b>          | dimensionless | FLOAT   | 8 | -999 | Polynomial coefficient for the astrometric fit component ( $x^0 y^2$ ) for focal plane M.  |
| <b>processingVersion</b> | dimensionless | TINYINT | 1 | NA   | Data release version.                                                                      |

## ImageDetEffMeta

**Description: Contains the detection efficiency information for a given individual OTA image. Provides the number of recovered sources out of 500 injected fake source and statistics about the magnitudes of the recovered sources for a range of magnitude offsets.**

| Name              | Unit          | Data Type | Size | Default Value | Description                                                                |
|-------------------|---------------|-----------|------|---------------|----------------------------------------------------------------------------|
| <b>imageID</b>    | dimensionless | BIGINT    | 8    | NA            | Unique image identifier. Constructed as (100 * frameID + ccdID).           |
| <b>frameID</b>    | dimensionless | INT       | 4    | NA            | Unique frame/exposure identifier.                                          |
| <b>magref</b>     | magnitudes    | REAL      | 4    | NA            | Detection efficiency reference magnitude.                                  |
| <b>nInjected</b>  | dimensionless | INT       | 4    | NA            | Number of fake sources injected in each magnitude bin.                     |
| <b>offset01</b>   | magnitudes    | REAL      | 4    | NA            | Detection efficiency magnitude offset for bin 1.                           |
| <b>counts01</b>   | dimensionless | REAL      | 4    | NA            | Detection efficiency count of recovered sources in bin 1.                  |
| <b>diffMean01</b> | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude difference in bin 1.                   |
| <b>diffStdv01</b> | magnitudes    | REAL      | 4    | NA            | Detection efficiency standard deviation of magnitude differences in bin 1. |

|                     |               |      |   |    |                                                                            |
|---------------------|---------------|------|---|----|----------------------------------------------------------------------------|
| <b>errMean01</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 1.                        |
| <b>offset02</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 2.                           |
| <b>counts02</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 2.                  |
| <b>diffMean02</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 2.                   |
| <b>diffStddev02</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 2. |
| <b>errMean02</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 2.                        |
| <b>offset03</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 3.                           |
| <b>counts03</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 3.                  |
| <b>diffMean03</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 3.                   |
| <b>diffStddev03</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 3. |
| <b>errMean03</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 3.                        |
| <b>offset04</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 4.                           |
| <b>counts04</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 4.                  |
| <b>diffMean04</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 4.                   |
| <b>diffStddev04</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 4. |
| <b>errMean04</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 4.                        |
| <b>offset05</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 5.                           |
| <b>counts05</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 5.                  |
| <b>diffMean05</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 5.                   |
| <b>diffStddev05</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 5. |
| <b>errMean05</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 5.                        |
| <b>offset06</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 6.                           |
| <b>counts06</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 6.                  |
| <b>diffMean06</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 6.                   |
| <b>diffStddev06</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 6. |
| <b>errMean06</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 6.                        |
| <b>offset07</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 7.                           |
| <b>counts07</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 7.                  |
| <b>diffMean07</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 7.                   |
| <b>diffStddev07</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 7. |

|                     |               |      |   |    |                                                                             |
|---------------------|---------------|------|---|----|-----------------------------------------------------------------------------|
| <b>errMean07</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 7.                         |
| <b>offset08</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 8.                            |
| <b>counts08</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 8.                   |
| <b>diffMean08</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 8.                    |
| <b>diffStddev08</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 8.  |
| <b>errMean08</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 8.                         |
| <b>offset09</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 9.                            |
| <b>counts09</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 9.                   |
| <b>diffMean09</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 9.                    |
| <b>diffStddev09</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 9.  |
| <b>errMean09</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 9.                         |
| <b>offset10</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 10.                           |
| <b>counts10</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 10.                  |
| <b>diffMean10</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 10.                   |
| <b>diffStddev10</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 10. |
| <b>errMean10</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 10.                        |
| <b>offset11</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 11.                           |
| <b>counts11</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 11.                  |
| <b>diffMean11</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 11.                   |
| <b>diffStddev11</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 11. |
| <b>errMean11</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 11.                        |
| <b>offset12</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 12.                           |
| <b>counts12</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 12.                  |
| <b>diffMean12</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 12.                   |
| <b>diffStddev12</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 12. |
| <b>errMean12</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 12.                        |
| <b>offset13</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 13.                           |
| <b>counts13</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 13.                  |
| <b>diffMean13</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 13.                   |
| <b>diffStddev13</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 13. |

|                  |            |      |   |    |                                                      |
|------------------|------------|------|---|----|------------------------------------------------------|
| <b>errMean13</b> | magnitudes | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 13. |
|------------------|------------|------|---|----|------------------------------------------------------|

## DiffToImage

**Description:** Contains the mapping of which input images were used to construct a particular difference image.

| Name               | Unit          | Data Type | Size | Default Value | Description                                                      |
|--------------------|---------------|-----------|------|---------------|------------------------------------------------------------------|
| <b>diffImageID</b> | dimensionless | BIGINT    | 8    | NA            | Unique difference identifier.                                    |
| <b>imageID</b>     | dimensionless | BIGINT    | 8    | NA            | Unique image identifier. Constructed as (100 * frameID + ccdID). |

## ForcedWarpToImage

**Description:** Contains the mapping of which input image comprises a particular warp image used for forced photometry.

| Name                | Unit          | Data Type | Size | Default Value | Description                                                      |
|---------------------|---------------|-----------|------|---------------|------------------------------------------------------------------|
| <b>forcedWarpID</b> | dimensionless | BIGINT    | 8    | NA            | Unique forced warp identifier.                                   |
| <b>imageID</b>      | dimensionless | BIGINT    | 8    | NA            | Unique image identifier. Constructed as (100 * frameID + ccdID). |

## DiffMeta

**Description:** Contains metadata related to a difference image constructed by subtracting a stacked image from a single epoch image, or in the case of the MD Survey from a nightly stack (stack made from all exposures in a single filter in a single night). The astrometric calibration of the reference stack is listed.

| Name               | Unit          | Data Type | Size | Default Value | Description                                                                                                                                                                                                             |
|--------------------|---------------|-----------|------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>diffImageID</b> | dimensionless | BIGINT    | 8    | NA            | Unique difference identifier.                                                                                                                                                                                           |
| <b>batchID</b>     | dimensionless | BIGINT    | 8    | NA            | Internal database batch identifier.                                                                                                                                                                                     |
| <b>surveyID</b>    | dimensionless | TINYINT   | 1    | NA            | Survey identifier. Details in the Survey table.                                                                                                                                                                         |
| <b>filterID</b>    | dimensionless | TINYINT   | 1    | NA            | Filter identifier. Details in the Filter table.                                                                                                                                                                         |
| <b>diffTypeID</b>  | dimensionless | TINYINT   | 1    | 0             | Difference type identifier. Details in the DiffType table.                                                                                                                                                              |
| <b>frameID</b>     | dimensionless | INT       | 4    | NA            | Frame/exposure identifier for the positive image in warp-stack difference images; not populated for stack-stack differences.                                                                                            |
| <b>posImageID</b>  | dimensionless | BIGINT    | 8    | NA            | Image identifier for the positive image. For warp-stack difference images, this corresponds to the ForcedWarpToImage.forcedWarpID entry. For stack-stack difference images, this corresponds to StackMeta.stackImageID. |
| <b>negImageID</b>  | dimensionless | BIGINT    | 8    | NA            | Image identifier for the negative image. For warp-stack difference images, this corresponds to the StackMeta.stackImageID entry.                                                                                        |

|                           |               |              |     |      |                                                                                                                     |
|---------------------------|---------------|--------------|-----|------|---------------------------------------------------------------------------------------------------------------------|
| <b>ippDiffID</b>          | dimensionless | BIGINT       | 8   | NA   | IPP diffRun identifier.                                                                                             |
| <b>tessID</b>             | dimensionless | TINYINT      | 1   | 0    | Tessellation identifier. Details in the TessellationType table.                                                     |
| <b>projectionID</b>       | dimensionless | SMALLINT     | 2   | -1   | Projection cell identifier.                                                                                         |
| <b>skyCellID</b>          | dimensionless | TINYINT      | 1   | 255  | Skycell region identifier.                                                                                          |
| <b>photoCalID</b>         | dimensionless | INT          | 4   | NA   | Photometric calibration identifier. Details in the PhotoCal table.                                                  |
| <b>analysisVer</b>        | dimensionless | VARCHAR(100) | 100 |      | IPP software analysis release version.                                                                              |
| <b>md5sum</b>             | dimensionless | VARCHAR(100) | 100 |      | IPP MD5 Checksum.                                                                                                   |
| <b>detectionThreshold</b> | magnitudes    | REAL         | 4   | -999 | Reference magnitude for detection efficiency calculation.                                                           |
| <b>expTime</b>            | seconds       | REAL         | 4   | -999 | Exposure time of positive image. Necessary for converting listed fluxes and magnitudes back to measured ADU counts. |
| <b>psfModelID</b>         | dimensionless | INT          | 4   | -999 | PSF model identifier.                                                                                               |
| <b>psfFWHM</b>            | arcsec        | REAL         | 4   | -999 | Mean PSF full width at half maximum at image center.                                                                |
| <b>psfWidthMajor</b>      | arcsec        | REAL         | 4   | -999 | PSF major axis FWHM at image center.                                                                                |
| <b>psfWidthMinor</b>      | arcsec        | REAL         | 4   | -999 | PSF minor axis FWHM at image center.                                                                                |
| <b>psfTheta</b>           | degrees       | REAL         | 4   | -999 | PSF major axis orientation at image center.                                                                         |
| <b>kernel</b>             | dimensionless | VARCHAR(100) | 100 |      | Subtraction kernel.                                                                                                 |
| <b>mode</b>               | dimensionless | TINYINT      | 1   | 0    | Subtraction mode for which input to convolve.                                                                       |
| <b>numStamps</b>          | dimensionless | INT          | 4   | -999 | Number of stamps.                                                                                                   |
| <b>stampDevMean</b>       | dimensionless | REAL         | 4   | -999 | Mean stamp deviation.                                                                                               |
| <b>stampDevRMS</b>        | dimensionless | REAL         | 4   | -999 | RMS stamp deviation.                                                                                                |
| <b>normalization</b>      | dimensionless | REAL         | 4   | -999 | Normalization.                                                                                                      |
| <b>convolveMax</b>        | dimensionless | REAL         | 4   | -999 | Maximum convolution fraction.                                                                                       |
| <b>deconvolveMax</b>      | dimensionless | REAL         | 4   | -999 | Maximum deconvolution fraction.                                                                                     |
| <b>ctype1</b>             | dimensionless | VARCHAR(100) | 100 |      | Name of astrometric projection in right ascension.                                                                  |
| <b>ctype2</b>             | dimensionless | VARCHAR(100) | 100 |      | Name of astrometric projection in declination.                                                                      |
| <b>crval1</b>             | degrees       | FLOAT        | 8   | -999 | Right ascension corresponding to reference pixel.                                                                   |
| <b>crval2</b>             | degrees       | FLOAT        | 8   | -999 | Declination corresponding to reference pixel.                                                                       |
| <b>crpix1</b>             | sky pixels    | FLOAT        | 8   | -999 | Reference pixel for right ascension.                                                                                |
| <b>crpix2</b>             | sky pixels    | FLOAT        | 8   | -999 | Reference pixel for declination.                                                                                    |
| <b>cdelt1</b>             | degrees/pixel | FLOAT        | 8   | -999 | Pixel scale in right ascension.                                                                                     |
| <b>cdelt2</b>             | degrees/pixel | FLOAT        | 8   | -999 | Pixel scale in declination.                                                                                         |
| <b>pc001001</b>           | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and right ascension.                                     |

|                   |               |         |   |      |                                                                                 |
|-------------------|---------------|---------|---|------|---------------------------------------------------------------------------------|
| pc001002          | dimensionless | FLOAT   | 8 | -999 | Linear transformation matrix element between image pixel y and right ascension. |
| pc002001          | dimensionless | FLOAT   | 8 | -999 | Linear transformation matrix element between image pixel x and declination.     |
| pc002002          | dimensionless | FLOAT   | 8 | -999 | Linear transformation matrix element between image pixel y and declination.     |
| processingVersion | dimensionless | TINYINT | 1 | NA   | Data release version.                                                           |

## DiffDetEffMeta

**Description:** Contains the detection efficiency information for a given individual difference image. Provides the number of recovered sources out of 500 injected sources and statistics about the magnitudes of the recovered sources for a range of magnitude offsets.

| Name         | Unit          | Data Type | Size | Default Value | Description                                                                |
|--------------|---------------|-----------|------|---------------|----------------------------------------------------------------------------|
| diffImageID  | dimensionless | BIGINT    | 8    | NA            | Unique difference image identifier.                                        |
| magref       | magnitudes    | REAL      | 4    | NA            | Detection efficiency reference magnitude.                                  |
| nInjected    | dimensionless | INT       | 4    | NA            | Number of fake sources injected in each magnitude bin.                     |
| offset01     | magnitudes    | REAL      | 4    | NA            | Detection efficiency magnitude offset for bin 1.                           |
| counts01     | dimensionless | REAL      | 4    | NA            | Detection efficiency count of recovered sources in bin 1.                  |
| diffMean01   | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude difference in bin 1.                   |
| diffStddev01 | magnitudes    | REAL      | 4    | NA            | Detection efficiency standard deviation of magnitude differences in bin 1. |
| errMean01    | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude error in bin 1.                        |
| offset02     | magnitudes    | REAL      | 4    | NA            | Detection efficiency magnitude offset for bin 2.                           |
| counts02     | dimensionless | REAL      | 4    | NA            | Detection efficiency count of recovered sources in bin 2.                  |
| diffMean02   | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude difference in bin 2.                   |
| diffStddev02 | magnitudes    | REAL      | 4    | NA            | Detection efficiency standard deviation of magnitude differences in bin 2. |
| errMean02    | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude error in bin 2.                        |
| offset03     | magnitudes    | REAL      | 4    | NA            | Detection efficiency magnitude offset for bin 3.                           |
| counts03     | dimensionless | REAL      | 4    | NA            | Detection efficiency count of recovered sources in bin 3.                  |
| diffMean03   | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude difference in bin 3.                   |
| diffStddev03 | magnitudes    | REAL      | 4    | NA            | Detection efficiency standard deviation of magnitude differences in bin 3. |
| errMean03    | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude error in bin 3.                        |
| offset04     | magnitudes    | REAL      | 4    | NA            | Detection efficiency magnitude offset for bin 4.                           |
| counts04     | dimensionless | REAL      | 4    | NA            | Detection efficiency count of recovered sources in bin 4.                  |
| diffMean04   | magnitudes    | REAL      | 4    | NA            | Detection efficiency mean magnitude difference in bin 4.                   |

|                     |               |      |   |    |                                                                            |
|---------------------|---------------|------|---|----|----------------------------------------------------------------------------|
| <b>diffStddev04</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 4. |
| <b>errMean04</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 4.                        |
| <b>offset05</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 5.                           |
| <b>counts05</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 5.                  |
| <b>diffMean05</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 5.                   |
| <b>diffStddev05</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 5. |
| <b>errMean05</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 5.                        |
| <b>offset06</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 6.                           |
| <b>counts06</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 6.                  |
| <b>diffMean06</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 6.                   |
| <b>diffStddev06</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 6. |
| <b>errMean06</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 6.                        |
| <b>offset07</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 7.                           |
| <b>counts07</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 7.                  |
| <b>diffMean07</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 7.                   |
| <b>diffStddev07</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 7. |
| <b>errMean07</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 7.                        |
| <b>offset08</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 8.                           |
| <b>counts08</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 8.                  |
| <b>diffMean08</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 8.                   |
| <b>diffStddev08</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 8. |
| <b>errMean08</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 8.                        |
| <b>offset09</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 9.                           |
| <b>counts09</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 9.                  |
| <b>diffMean09</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 9.                   |
| <b>diffStddev09</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 9. |
| <b>errMean09</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 9.                        |
| <b>offset10</b>     | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 10.                          |
| <b>counts10</b>     | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 10.                 |
| <b>diffMean10</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 10.                  |



|                    |               |      |   |    |                                                                             |
|--------------------|---------------|------|---|----|-----------------------------------------------------------------------------|
| <b>diffStdev10</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 10. |
| <b>errMean10</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 10.                        |
| <b>offset11</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 11.                           |
| <b>counts11</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 11.                  |
| <b>diffMean11</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 11.                   |
| <b>diffStdev11</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 11. |
| <b>errMean11</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 11.                        |
| <b>offset12</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 12.                           |
| <b>counts12</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 12.                  |
| <b>diffMean12</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 12.                   |
| <b>diffStdev12</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 12. |
| <b>errMean12</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 12.                        |
| <b>offset13</b>    | magnitudes    | REAL | 4 | NA | Detection efficiency magnitude offset for bin 13.                           |
| <b>counts13</b>    | dimensionless | REAL | 4 | NA | Detection efficiency count of recovered sources in bin 13.                  |
| <b>diffMean13</b>  | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude difference in bin 13.                   |
| <b>diffStdev13</b> | magnitudes    | REAL | 4 | NA | Detection efficiency standard deviation of magnitude differences in bin 13. |
| <b>errMean13</b>   | magnitudes    | REAL | 4 | NA | Detection efficiency mean magnitude error in bin 13.                        |

## ForcedWarpMeta

**Description: Contains the metadata related to a sky-aligned distortion corrected warp image, upon which forced photometry is performed. The astrometric and photometric calibration of the warp image are listed.**

| Name                | Unit          | Data Type | Size | Default Value | Description                                                                           |
|---------------------|---------------|-----------|------|---------------|---------------------------------------------------------------------------------------|
| <b>forcedWarpID</b> | dimensionless | BIGINT    | 8    | NA            | Unique forced warp identifier.                                                        |
| <b>batchID</b>      | dimensionless | BIGINT    | 8    | NA            | Internal database batch identifier.                                                   |
| <b>surveyID</b>     | dimensionless | TINYINT   | 1    | NA            | Survey identifier. Details in the Survey table.                                       |
| <b>filterID</b>     | dimensionless | TINYINT   | 1    | NA            | Filter identifier. Details in the Filter table.                                       |
| <b>frameID</b>      | dimensionless | INT       | 4    | NA            | Frame/exposure identifier of the Frame associated with this warp.                     |
| <b>ippSkycalID</b>  | dimensionless | INT       | 4    | NA            | IPP skycal identifier for the run that generated the positions for forced photometry. |
| <b>stackMetaID</b>  | dimensionless | INT       | 4    | NA            | Identifier for the stack which yielded the positions for forced photometry.           |
| <b>tessID</b>       | dimensionless | TINYINT   | 1    | 0             | Tessellation identifier. Details in the TessellationType table.                       |

|                          |               |              |     |      |                                                                                                                                                    |
|--------------------------|---------------|--------------|-----|------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>projectonID</b>       | dimensionless | SMALLINT     | 2   | -1   | Projection cell identifier.                                                                                                                        |
| <b>skyCellID</b>         | dimensionless | TINYINT      | 1   | 255  | Skycell region identifier.                                                                                                                         |
| <b>photoCalID</b>        | dimensionless | INT          | 4   | NA   | Photometric calibration identifier. Details in the PhotoCal table.                                                                                 |
| <b>analysisVer</b>       | dimensionless | VARCHAR(100) | 100 |      | IPP software analysis release version.                                                                                                             |
| <b>md5sum</b>            | dimensionless | VARCHAR(100) | 100 |      | IPP MD5 Checksum.                                                                                                                                  |
| <b>expTime</b>           | seconds       | REAL         | 4   | -999 | Exposure time of the source frame/exposure for this warp image. Necessary for converting listed fluxes and magnitudes back to measured ADU counts. |
| <b>recalAstroScatX</b>   | arcsec        | REAL         | 4   | -999 | Measurement of the re-calibration (not astrometric error) in the X direction.                                                                      |
| <b>recalAstroScatY</b>   | arcsec        | REAL         | 4   | -999 | Measurement of the re-calibration (not astrometric error) in the Y direction.                                                                      |
| <b>recalNAstroStars</b>  | dimensionless | INT          | 4   | -999 | Number of astrometric reference sources used in recalibration.                                                                                     |
| <b>recalphotoScat</b>    | magnitudes    | REAL         | 4   | -999 | Photometric scatter relative to reference catalog.                                                                                                 |
| <b>recalNPphotoStars</b> | dimensionless | INT          | 4   | -999 | Number of astrometric reference sources used in recalibration.                                                                                     |
| <b>psfModelID</b>        | dimensionless | INT          | 4   | -999 | PSF model identifier.                                                                                                                              |
| <b>psfFWHM</b>           | arcsec        | REAL         | 4   | -999 | Mean PSF full width at half maximum at image center.                                                                                               |
| <b>psfWidMajor</b>       | arcsec        | REAL         | 4   | -999 | PSF major axis FWHM at image center.                                                                                                               |
| <b>psfWidMinor</b>       | arcsec        | REAL         | 4   | -999 | PSF minor axis FWHM at image center.                                                                                                               |
| <b>psfTheta</b>          | degrees       | REAL         | 4   | -999 | PSF major axis orientation at image center.                                                                                                        |
| <b>photoZero</b>         | magnitudes    | REAL         | 4   | -999 | Locally derived photometric zero point for this warp image.                                                                                        |
| <b>ctype1</b>            | dimensionless | VARCHAR(100) | 100 |      | Name of astrometric projection in right ascension.                                                                                                 |
| <b>ctype2</b>            | dimensionless | VARCHAR(100) | 100 |      | Name of astrometric projection in declination.                                                                                                     |
| <b>crval1</b>            | degrees       | FLOAT        | 8   | -999 | Right ascension corresponding to reference pixel.                                                                                                  |
| <b>crval2</b>            | degrees       | FLOAT        | 8   | -999 | Declination corresponding to reference pixel.                                                                                                      |
| <b>crpix1</b>            | sky pixels    | FLOAT        | 8   | -999 | Reference pixel for right ascension.                                                                                                               |
| <b>crpix2</b>            | sky pixels    | FLOAT        | 8   | -999 | Reference pixel for declination.                                                                                                                   |
| <b>cdelt1</b>            | degrees/pixel | FLOAT        | 8   | -999 | Pixel scale in right ascension.                                                                                                                    |
| <b>cdelt2</b>            | degrees/pixel | FLOAT        | 8   | -999 | Pixel scale in declination.                                                                                                                        |
| <b>pc001001</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and right ascension.                                                                    |
| <b>pc001002</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel y and right ascension.                                                                    |
| <b>pc002001</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel x and declination.                                                                        |
| <b>pc002002</b>          | dimensionless | FLOAT        | 8   | -999 | Linear transformation matrix element between image pixel y and declination.                                                                        |
| <b>processingVersion</b> | dimensionless | TINYINT      | 1   | NA   | Data release version.                                                                                                                              |