

# PS1 Detection Flags

The detection flags contain information of detections in the warp and stack images.

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## DetectionFlags values, e.g. column **infoFlag** in table [Detection](#) (DR2 only), and **XinfoFlag** (X one of g, r, i, z, y) in [StackObjectThin](#)

These values are also listed in the system metadata table [DetectionFlags](#).

Flag Name	Flag value in hexadecimal form	Flag value in decimal form	Description of the flag
DEFAULT	0x00000000	0	Initial value; resets all bits.
PSFMODEL	0x00000001	1	Source fitted with a psf model (linear or non-linear).
EXTMODEL	0x00000002	2	Source fitted with an extended-source model.
FITTED	0x00000004	4	Source fitted with non-linear model (PSF or EXT; good or bad).
FAIL	0x00000008	8	Fit (non-linear) failed (non-converge; off-edge; run to zero).
POOR	0x00000010	16	Fit succeeds; but low-S/N; high-Chisq; or large (for PSF -- drop?).
PAIR	0x00000020	32	Source fitted with a double PSF.
PSFSTAR	0x00000040	64	Source used to define PSF model.
SATSTAR	0x00000080	128	Source model peak is above saturation.
BLEND	0x00000100	256	Source is a blend with other sources.
EXTERNAL	0x00000200	512	Source based on supplied input position.
BADPSF	0x00000400	1024	Failed to get good estimate of object's PSF.
DEFECT	0x00000800	2048	Source is thought to be a defect.
SATURATED	0x00001000	4096	Source is thought to be saturated pixels (bleed trail).
CR_LIMIT	0x00002000	8192	Source has crNsigma above limit.
EXT_LIMIT	0x00004000	16384	Source has extNsigma above limit.
MOMENTS_FAILURE	0x00008000	32768	Could not measure the moments.
SKY_FAILURE	0x00010000	65536	Could not measure the local sky.
SKYVAR_FAILURE	0x00020000	131072	Could not measure the local sky variance.
BELOW_MOMENTS_SN	0x00040000	262144	Moments not measured due to low S/N.
UNDEF_1	0x00080000	524288	Unused bit value.
BIG_RADIUS	0x00100000	1048576	Poor moments for small radius; try large radius.
AP_MAGS	0x00200000	2097152	Source has an aperture magnitude.
BLEND_FIT	0x00400000	4194304	Source was fitted as a blend.
EXTENDED_FIT	0x00800000	8388608	Full extended fit was used.
EXTENDED_STATS	0x01000000	16777216	Extended aperture stats calculated.
LINEAR_FIT	0x02000000	33554432	Source fitted with the linear fit.
NONLINEAR_FIT	0x04000000	67108864	Source fitted with the non-linear fit.
RADIAL_FLUX	0x08000000	134217728	Radial flux measurements calculated.
SIZE_SKIPPED	0x10000000	268435456	Size could not be determined.
PEAK_ON_SPIKE	0x20000000	536870912	Peak lands on diffraction spike.
PEAK_ON_GHOST	0x40000000	1073741824	Peak lands on ghost or glint.

PEAK_OFF_CHIP	0x80000000	2147483648	Peak lands off edge of chip.
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DetectionFlags2 values, e.g. column **infoFlag2** in table [Detection](#) (DR2 only), and **XinfoFlag2** (X one of g, r, i, z, y) in [StackObjectThin](#)

These values are also listed in the system metadata table [DetectionFlags2](#).

Flag Name	Flag value in hexadecimal form	Flag value in decimal form	Description of the flag
DEFAULT	0x00000000	0	Initial value; resets all bits.
DIFF_WITH_SINGLE	0x00000001	1	Difference source matched to a single positive detection.
DIFF_WITH_DOUBLE	0x00000002	2	Difference source matched to positive detections in both images.
MATCHED	0x00000004	4	Source generated based on another image (forced photometry at source location).
ON_SPIKE	0x00000008	8	More than 25% of (PSF-weighted) pixels land on diffraction spike.
ON_STARCORE	0x00000010	16	More than 25% of (PSF-weighted) pixels land on starcore.
ON_BURNTOOL	0x00000020	32	More than 25% of (PSF-weighted) pixels land on burnttool.
ON_CONVPOOR	0x00000040	64	More than 25% of (PSF-weighted) pixels land on convpoor.
PASS1_SRC	0x00000080	128	Source detected in first pass analysis
HAS_BRIGHTER_NEIGHBOR	0x00000100	256	Peak is not the brightest in its footprint
BRIGHT_NEIGHBOR_1	0x00000200	512	$\text{Flux\_negative} / (r^2 \text{ flux\_positive}) > 1$ .
BRIGHT_NEIGHBOR_10	0x00000400	1024	$\text{Flux\_negative} / (r^2 \text{ flux\_positive}) > 10$ .
DIFF_SELF_MATCH	0x00000800	2048	Positive detection match is probably this source.
SATSTAR_PROFILE	0x00001000	4096	Saturated source is modeled with a radial profile.
ECONTOUR_FEW_PTS	0x00002000	8192	Too few points to measure the elliptical contour.
RADBIN_NAN_CENTER	0x00004000	16384	Radial bins failed with too many NaN center bin.
PETRO_NAN_CENTER	0x00008000	32768	Petrosian (1976) radial bins failed with too many NaN center bin.
PETRO_NO_PROFILE	0x00010000	65536	Petrosian (1976) not built because radial bins missing.
PETRO_INSIG_RATIO	0x00020000	131072	Insignificant measurement of Petrosian (1976) ratio.
PETRO_RATIO_ZEROBIN	0x00040000	262144	Petrosian (1976) ratio in the 0th bin (likely bad).
EXT_FITS_RUN	0x00080000	524288	Attempted to run extended fits on this source.
EXT_FITS_FAIL	0x00100000	1048576	At least one of the model fits failed.
EXT_FITS_RETRY	0x00200000	2097152	One of the model fits was retried with new window.
EXT_FITS_NONE	0x00400000	4194304	All of the model fits failed.

DetectionFlags3 values, e.g. column **infoFlag3** in table [Detection](#) (DR2 only), and **XinfoFlag3** (X one of g, r, i, z, y) in [StackObjectThin](#)

These values are also listed in the system metadata table [DetectionFlags3](#).

Flag Name	Flag value in hexadecimal form	Flag value in decimal form	Description of the flag
DEFAULT	0x00000000	0	Initial value; resets all bits.
NOCAL	0x00000001	1	Detection ignored for this analysis (photcode\; time range) -- internal only.
POOR_PHOTOM	0x00000002	2	Detection is photometry outlier.
SKIP_PHOTOM	0x00000004	4	Detection was ignored for photometry measurement.
AREA	0x00000008	8	Detection near image edge.
POOR_ASTROM	0x00000010	16	Detection is astrometry outlier.

SKIP_Astrom	0x00000020	32	Detection was ignored for astrometry measurement.
USED_OBJ	0x00000040	64	Detection was used during update objects
USED_CHIP	0x00000080	128	Detection was used during update chips.
BLEND_MEAS	0x00000100	256	Detection is within radius of multiple objects.
BLEND_OBJ	0x00000200	512	Multiple detections within radius of object.
WARP_USED	0x00000400	1024	Measurement used to find mean warp photometry.
UNDEF_4	0x00000800	2048	Unused bit value.
BLEND_MEAS_X	0x00001000	4096	Detection is within radius of multiple objects across catalogs.
ARTIFACT	0x00002000	8192	Detection is thought to be non-astronomical.
SYNTH_MAG	0x00004000	16384	Magnitude is synthetic.
PHOTOM_UBERCAL	0x00008000	32768	Externally-supplied zero point from ubercal analysis.
STACK_PRIMARY	0x00010000	65536	This stack measurement is in the primary skycell.
STACK_PHOT_SRC	0x00020000	131072	This measurement supplied the stack photometry.
ICRF_QSO	0x00040000	262144	This measurement is an ICRF reference position.
IMAGE_EPOCH	0x00080000	524288	This measurement is registered to the image epoch (not tied to the reference catalog epoch).
PHOTOM_PSF	0x00100000	1048576	This measurement is used for the mean PSF magnitude.
PHOTOM_APER	0x00200000	2097152	This measurement is used for the mean aperture magnitude.
PHOTOM_KRON	0x00400000	4194304	This measurement is used for the mean Kron (1980) magnitude.
MASKED_PSF	0x01000000	16777216	This measurement is masked based on IRLS weights for the mean PSF magnitude.
MASKED_APER	0x02000000	33554432	This measurement is masked based on IRLS weights for the mean aperture magnitude.
MASKED_KRON	0x04000000	67108864	This measurement is masked based on IRLS weights for the mean Kron (1980) magnitude.
OBJECT_HAS_2MASS	0x10000000	268435456	This measurement comes from an object with 2MASS data.
OBJECT_HAS_GAIA	0x20000000	536870912	This measurement comes from an object with Gaia data.
OBJECT_HAS_TYCHO	0x40000000	1073741824	This measurement comes from an object with Tycho data.