PS1 Comparison of different photometric measures

Contents

- Stellar magnitudes
- Galaxy magnitudes
  - Kron magnitudes
  - Petrosian, Sersic, DeVauc, Exp, Aperture magnitudes

The starting point for the PS1 data archive is at Pan-STARRS1 data archive home page.

Stellar magnitudes

The table below shows a comparison of the stellar *g-i* v *i* colour-magnitude diagrams of the globular cluster Messier 53 produced from the various different photometric data available in DR1. From left to right we show on each row PSFmag, ApMag and KronMag. The different rows show the data from the MeanObject table, the StackObject table and the ForcedMeanObject table. A basic star/galaxy separation has been performed using a cut of -0.2 < (PSF-Kron) < 0.0 to identify stars.

	PSFMag	ApMag	KronMag
MeanObject	blocked URL	blocked URL	blocked URL
StackObject	blocked URL	blocked URL	blocked URL
ForcedMeanObject	blocked URL	blocked URL	blocked URL

Note that the MeanObject data are only to the depth of a single exposure, whereas the StackObject and ForcedMeanObject data go to the full depth of the stack. The smallest errors are clearly to be found by using the MeanObject PSFmags. For the stack data, in general ForcedMeanObject PSFmags give slightly tighter results than StackObject (due to the effect of the variable PSF on the stacked exposures).

Galaxy magnitudes

Kron magnitudes

For galaxies we show the *g-r* v *r* colour-magnitude diagram for a one square degree area around the Coma cluster (Abell 1656). Again star/galaxy separation has been performed with a simple PSF-Kron cut. Stars are shown in blue, galaxies in red. There is not a great deal of difference between the MeanObject and StackObject data, apart from the StackObject being deeper of course. The forced data may have some issues at the faintest mags.

	KronMag
MeanObject	blocked URL
StackObject	blocked URL
ForcedMeanObject	blocked URL

Petrosian, Sersic, DeVauc, Exp, Aperture magnitudes

We now show the results of the other methods available appropriate for galaxies (using Abell 1656 agaIn). With the exception of the aperture data, all these are available only for restricted datasets (outside the galactic plane and above a signal-to-noise threshold which roughly corresponds to *i*<21. Again, stars are indicated in blue and galaxies in red. As we have just selected from the appropriate extended tables joined to ObjectThin, the star/galaxy separation is somewhat trickier here: we use magnitude v radius for Petrosian/Sersic/DeVauc/Exp, and the difference between R5 and R7 radii for apertures. Ideally one would also join to StackObjectThin, then PSF-Kron could be used again.

Note that in DR1 these extended source measures (Petrosian, Sersic, DeVauc, Exp) have not been subject to as much testing as the PSF and Kron magnitudes, and may not be as reliable. The Petrosians, in particular, are known to have issues,

	Petrosian	Sersic	DeVauc	Exp	Aperture (R5)
Stack...	blocked URL	blocked URL	blocked URL	blocked URL	blocked URL