Stacking the Suprime-Cam image archive at the CADC

NRC.CNRC

Canadian Astronomy Data Centre

SUMMARY:

The CADC has started a project of stacking the Suprime-Cam image archive. The individual raw images are detrended (bias-subtracted and flat-fielded) using the sdfred2 software package. The images are then astrometrically calibrated using GAIA and photometrically calibrated using Pan-STARRS. The individual images are then resampled and stacked using SWarp on to a grid of tiles covering the sky.

The Suprime-Cam archive

- All Suprime-Cam images now public
- Only raw data
- 82000 images
- 6500 square degrees



Images transferred to the CADC VOSpace

Detrending with sdfred2

- For each run. build dome, twilight and night sky flats
- AG mask applied
- Individual chip files (ponyo, chihiro etc.) assembled into single Multi-Extension FITS file



Astrometric calibration with GAIA

- Initial chip-by-chip 2nd order polynomial in x,y
- final global distortion correction in r² and r⁴ plus linear terms in x,y
- Individual image calibration, no need to build internal catalog
- Astrometric accuracy: 50 mas
- Typical residuals shown at left

Photometric calibration with Pan-STARRS

- Convert PS1 magnitudes to Suprime-Cam
 filters
- Colour terms shown at right
- Use in-field standards to set image zero-point, regardless of photometric conditions
- Photometric accuracy: 0.01 mags





Resampling and stacking

Resampling according to astrometric

calibration

- Scale according to photometric calibration
 Output images are square tiles covering the sky
 - Resampling and co-addition with SWarp
- Example of re-gridding shown at right:
- Black boxes show Suprime-Cam footprint
 Red boxes show output tiles



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