

Extreme PSF Analysis (Most Blue and Most Red PSF)

Author : Bhishan Poudel

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1. Create Background for Phosim.

Program : aa_create_background.py

Depends : none

Output : backgrounds/background1.bkg

This program creates a background file for Phosim. In this background file we choose pixelsize 1.5 and saturation,blooming,chargesharing to be zero.

It will clobber the output folder backgrounds.

2. Create Seds for Phosim

Program : aa_create_sed_all.py

Depends : sed_flat.txt

Output : seds/narrowband*.sed

This program creates seds for all narrowbands.

We break the wavelength range 531-696 nm into 21 parts and decrease the normalizing wavelength at 500 nm by a factor of 100.

It will clobber the output folder seds.

3. Create Instance Catalogs for Phosim

Program : a1_create_instance_catalogs_0_20_seed.py

Depends : none

Output :

- instance_catalogs/narrowband0.icat
instance_catalogs/narrowband20.icat

This program creates instance catalogs for narrowband0 and narrowband20.

It will clobber the output folder each time this program runs.

4. Create zipped psf files using Phosim

Program : a2_phosim_narrow0_and_20.py

Depends :

- instance_catalogs/narrowband0.icat
instance_catalogs/narrowband20.icat
seeds/narrowband0.sed
seeds/narrowband20.sed
backgrounds/background1.bkg

Outputs :

- phosim_output_extreme_psf/narrowband0/17_zipped_psf_fitsfiles
phosim_output_extreme_psf/narrowband20/17_zipped_psf_fitsfiles

This program creates zipped psffiles for narrowband0 and narrowband20.
It will clobber the output folder each time this program runs.

5. Unzip psffiles created from Phosim

Program : a3_unzip_psf_0_20.py

Depends : phosim_output_extreme_psf/narrowband0_out/zipped_psf

Outputs : extreme_psf/psf0.fits_and_20

This program unzips zipped psffiles created from Phosim into *extreme_psf* folder.

6. Get imcat parameters e and rh for psf0 and psf20

Program : a4_imcat_e_rh_psf0_20.py

Inputs : extreme_psf/psf0.fits_and_psf20.fits

Outputs : gives 6 values of e and rh (i.e. e00 e10 rh0 e01 e11 rh1)

This program returns imcat variables e and rh for given input psf.

7. Create imcat variables datafile for different seed

Program : extreme_psf_phosim_imcat.py

Depends :

- a1_create_instance_catalogs_0_20_seed.py
argument: the SIM_SEED to run this program
- a2_phosim_narrow0_and_20.py # gives zipped psfs
./instance_catalogs
./seds
./backgrounds
- a3_unzip_psf_0_20.py phosim_output_extreme_psf/narrowband_0_and_20/zipped_psf
- a4_imcat_e_rh_psf0_20.py
returns e00 e10 rh0 e01 e11 rh1

Outputs : extreme_psf_phosim_imcat_seed_e_rh.dat

This program runs the above FOUR programs and creates imcat variables datafile for different seed.

8. Create psf using Phosim for outlier imcat values

Program : *outlier_psf_phosim.py*

Depends :

- a1_create_instance_catalogs_0_20_seed.py
argument: the SIM_SEED to run this program
- a2_phosim_narrow0_and_20.py # gives zipped psfs ./instance_catalogs
./seds
./backgrounds
- a3_unzip_psf_0_20.py phosim_output_extreme_psf/narrowband_0_and_20/zipped_psf

Outputs : outlier_psf/extreme_psf_seed/psf0_20.fits

This program runs above programs a1,a2,a3 and it copies final output folder of *a3_unzip_psf_0_20.py* (i.e, extreme_psf) into the folder **outlier_psf** with different seed number.