APPLY

Characterization of AO performance and PSF estimation

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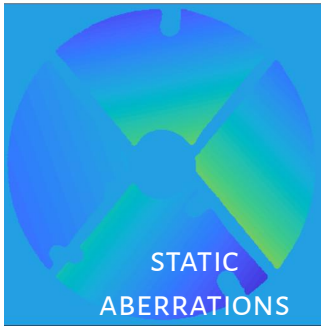
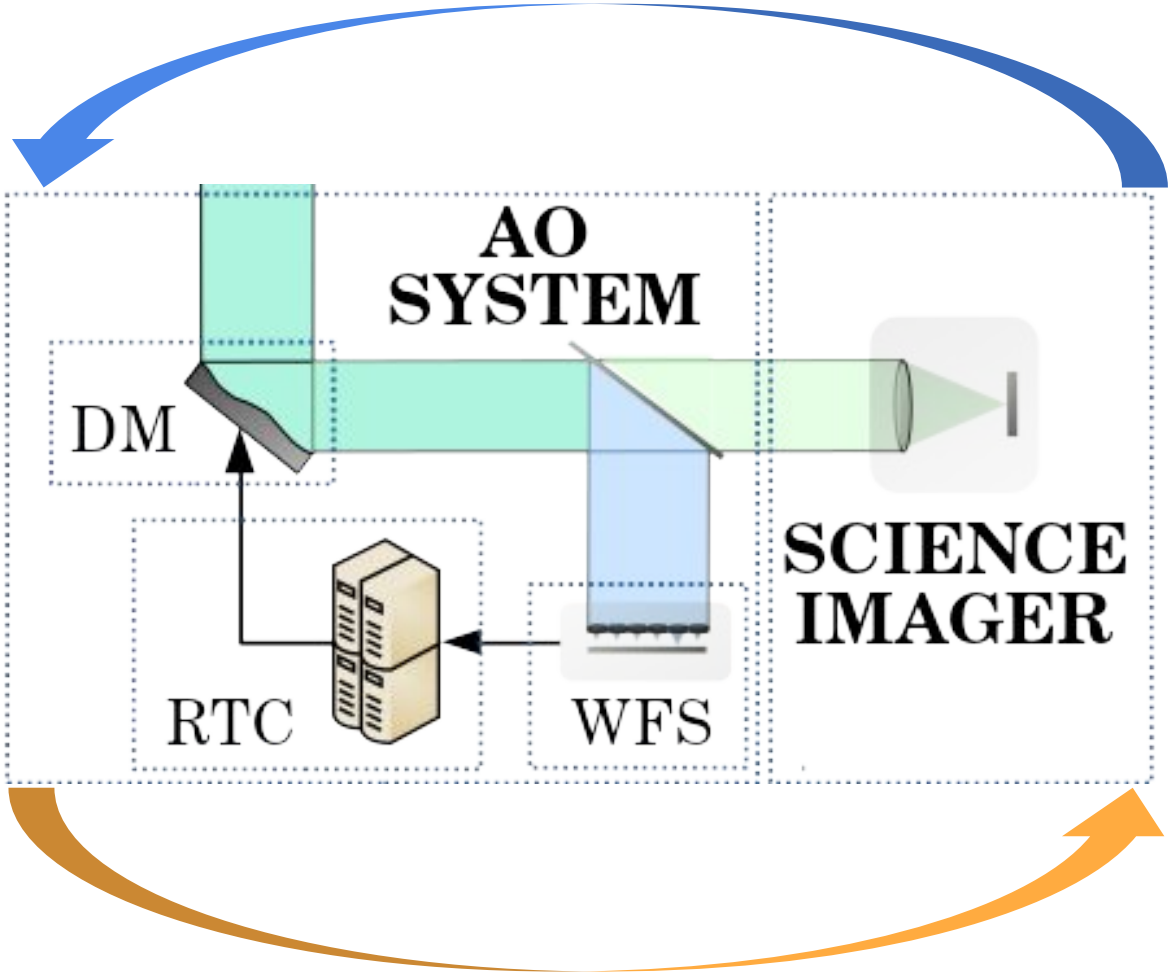
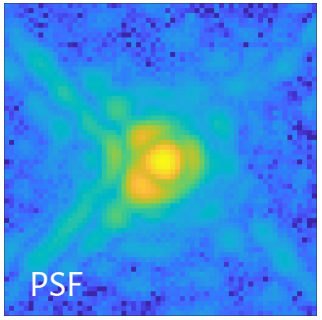
Introduction

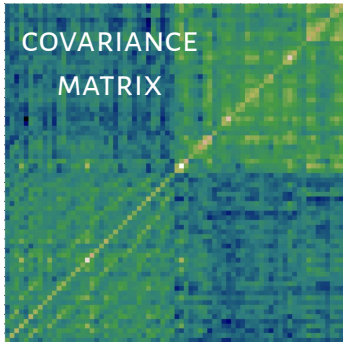
Task 1 :

Characterize jointly the atmospheric and instrumental defects from the PSF





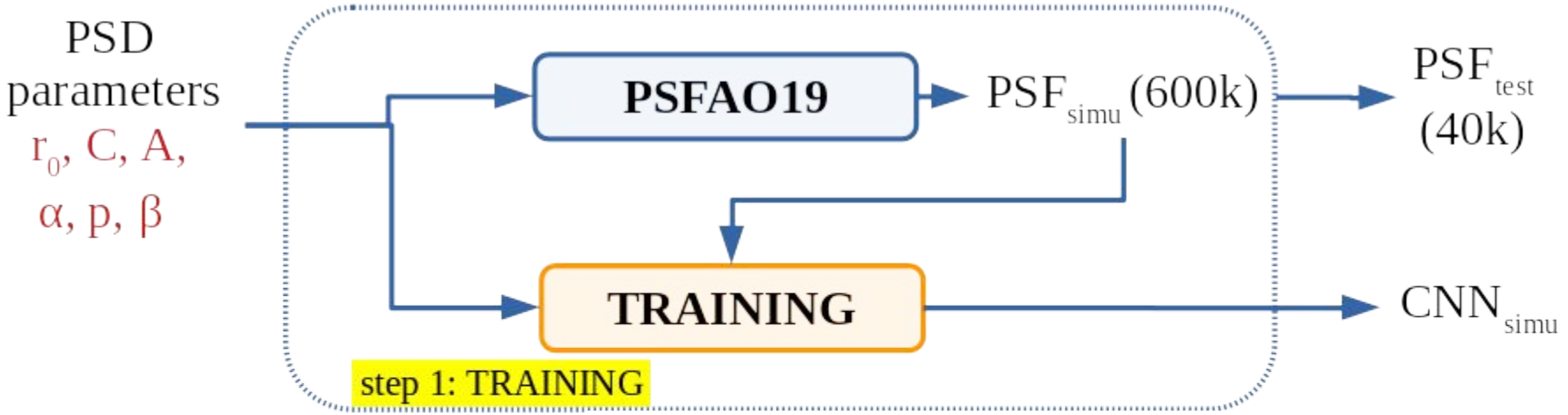




Task 2 :

Determine the PSF from contextual data during the observation.

Methods : CNN - 5 conv layers + 2 dense layers (Keras, TensorFlow, 3 GPU)

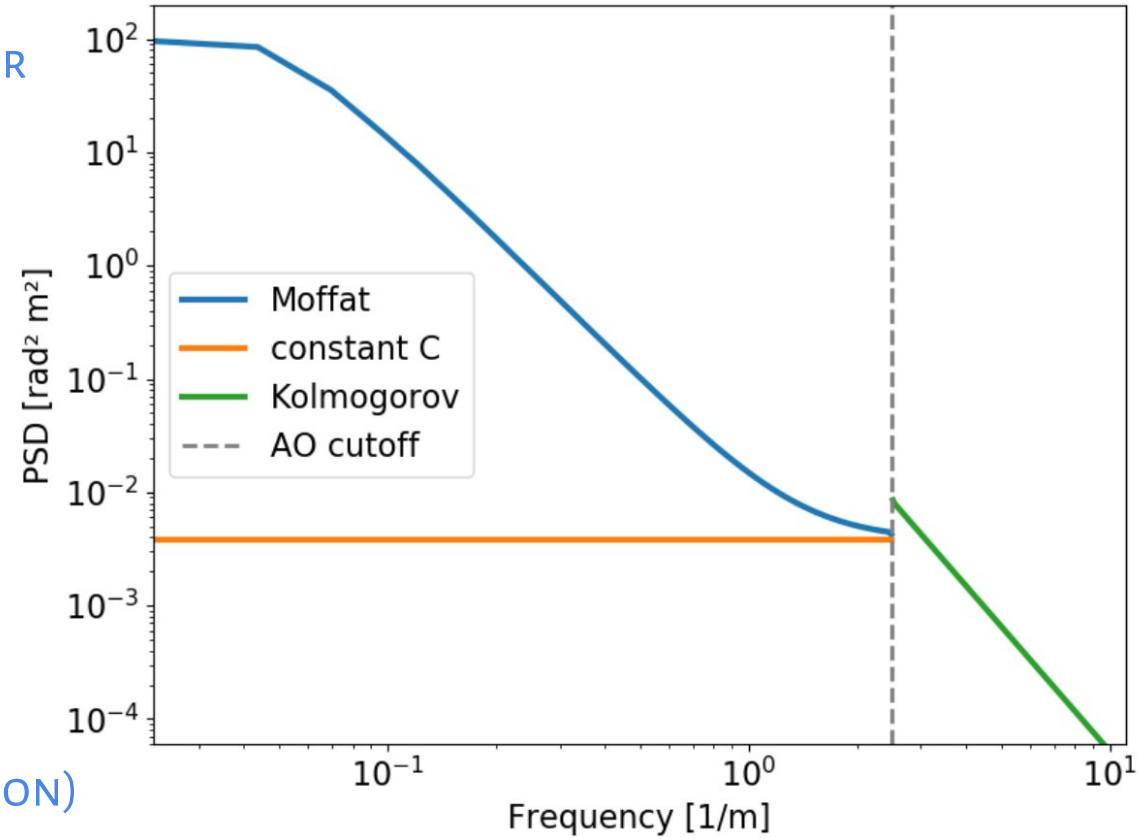


Model of the wavefront power spectrum density (PSD)

$$W(\kappa <= \kappa_{AO}) = M(\kappa, A, \alpha, \rho, \beta) + C$$

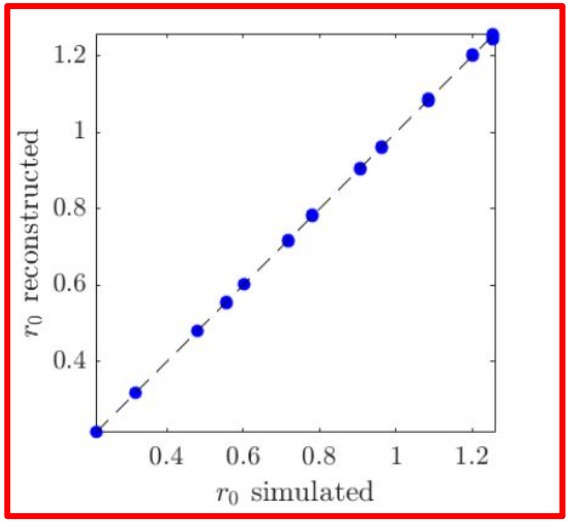
$$W(\kappa > \kappa_{AO}) = 0.023 r_0^{-5/3} \kappa^{-11/3}$$

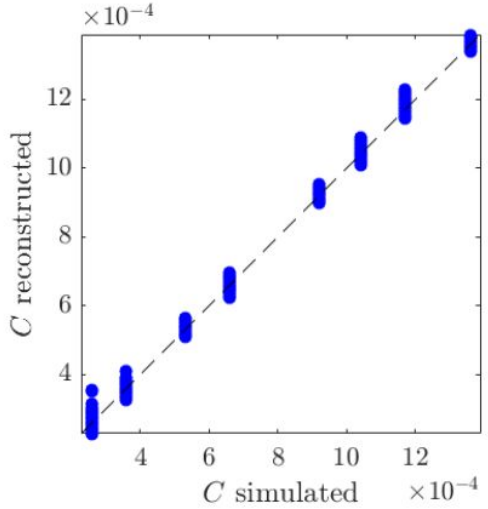
$$PSF = F[OTF_{DL}.\exp(F[W])]$$

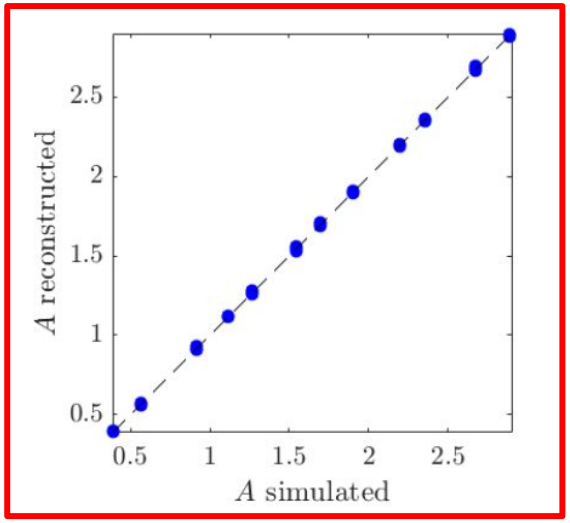


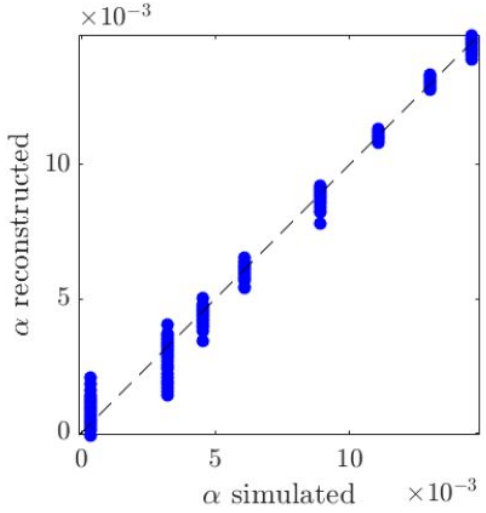
Model of the PSF (PSFAO19 - python)

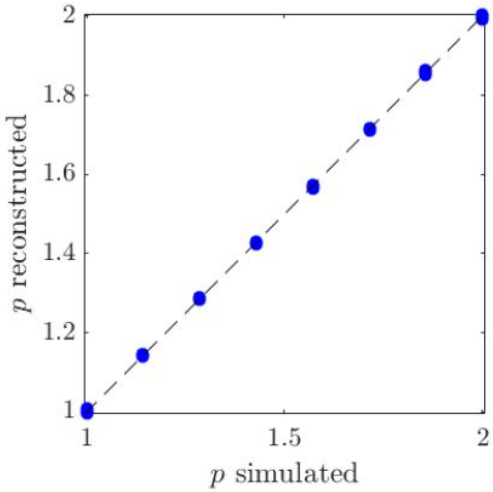
STATE OF THE PROJECT

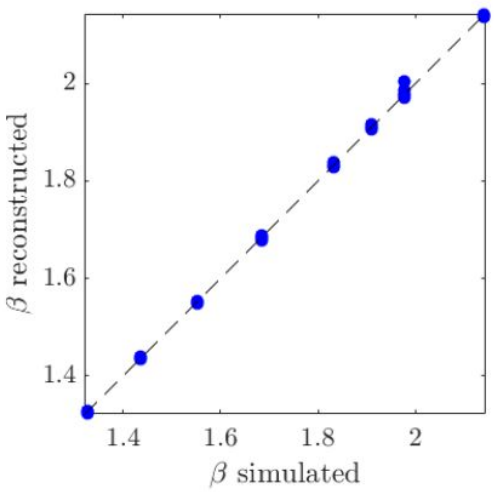












NO NOISE | ADDING NOISE | MODEL ERRORS | ON-SKY TESTS | TASK 2

Expectations from CESAM

- Scientific collaboration : expertise in ML/DL
- Interaction with the community - supervision
- technical support on hardware solutions