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The PSF Reconstruction service for MICADO@ELT

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MICADO is the first light adaptive optics instrument of ESO ELT, providing diffraction limited imaging and long-slit spectroscopy at near-infrared wavelengths. For most of the planned MICADO scientific applications, a detailed knowledge of the PSF is required. The PSF Reconstruction (PSF-R) Team of MICADO is currently developing, for the first time within all ESO telescopes, a software service devoted to the reconstruction of the instrumental PSF from telemetry data only, without accessing the scientific focal plane data themselves. The PSF-R tool will work both for data gathered with a single-conjugate natural guide star adaptive optics system (SCAO) and with a multi-conjugate laser guide star adaptive optics system (MCAO, developed by MAORY). The PSF-R service will support the state-of-the-art scientific analysis of the MICADO images and spectra, by further improving the reduction of AO data in a post processing phase. The functionalities and architecture of the PSF-R software will be highlighted in this presentation, together with an overview of the successful analysis of both MICADO simulated data and real data from the SCAO instrument SOUL at LBT. The development plan of the PSF-R service will be discussed, showing the status of the MICADO PSF-R deliverable and its readiness level. The PSF-R Team of MICADO has successfully fulfilled the Final Design Review recently, and it is ready to meet the ELT first light in 2027.

Primary authors: GRAZIAN, Andrea (Istituto Nazionale di Astrofisica (INAF)); Dr ZANELLA, Anita (INAF - Osservatorio di Padova); VULCANI, Benedetta (Istituto Nazionale di Astrofisica (INAF)); ARCIDIACONO, Carmelo (Istituto Nazionale di Astrofisica (INAF)); PORTALURI, Elisa (Istituto Nazionale di Astrofisica (INAF)); PEDICHINI, Fernando (Istituto Nazionale di Astrofisica (INAF)); GULLIEUSZIK, Marco (INAF - OAPd); SIMIONI, Matteo (Istituto Nazionale di Astrofisica (INAF)); PIAZZESI, Roberto (Istituto Nazionale di Astrofisica (INAF))

Presenter: GRAZIAN, Andrea (Istituto Nazionale di Astrofisica (INAF))

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