

The VLT's Laser Tomography Adaptive Optics and its Upgrades

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Abstract:

GALACSI Narrow Field Mode (NFM) is the only Laser Tomography Adaptive Optics (LTAO) system in operation, delivering diffraction limited performance in the visible. It feeds the integral field spectrograph MUSE that combines high spatial resolution and spectral resolution to address key science cases, making it the most requested instrument at the VLT. GALACSI NFM has been commissioned and delivered for science operation in 2018. Since then, an upgrade path has been followed. First, the high order LTAO loop was further optimized to increase the delivered strehl ratio and improve the robustness to worse seeing. More recently, the InfraRed Low Order Sensor (IRLOS) upgrade project was launched and implemented to improve the low order loop in order to reduce the Tip/Tilt jitter in high flux regime and increase the sky coverage by pushing the Natural Guide Star (NGS) limiting magnitude and increasing the patrol field.

In this talk, an overview of GALACSI NFM will be provided. Then, the upgrades will be highlighted, in particular the IRLOS upgrade. We will focus on a few key design aspects and then present some lessons learned from MAIT, AIV and commissioning. Finally, the achieved performance will be detailed, the project status summarized and future work proposed.

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