
Study of wavefront sensing strategies for the future EST based on laboratory results.

Luzma Montoya-Martinez^{*1}, Yolanda Martín Hernando¹, Noelia Feijoo¹, Jose Manuel González-Cava¹, Hareesh Chulani¹, Angela Hernández Delgado¹, Jorge Quintero¹, Francisco González¹, Miguel Núñez Cagigal¹, and Manuel Collados Vera¹

¹Instituto Astrofísica de Canarias – Spain

Abstract

The European Solar Telescope (EST) is a 4.2-metre telescope that will be equipped with a multi-conjugate adaptive optics (MCAO) system to provide a high spatial resolution over a circular field of view with 60" diameter. With the aim of evaluating and comparing the best adaptive optics strategies for EST, a testbed has been implemented in the laboratories of Instituto de Astrofísica de Canarias (IAC). The testbed is equipped with: an illumination system with point-like and extended sources capabilities coupled with a configurable turbulence simulator based on phase screens; a pupil-conjugated deformable mirror (DM) with 820 actuators; two correlation Shack-Hartmann wavefront sensors (SH-WFS); and the science detector. The bench is now ready to operate in Single Conjugate Adaptive Optics (SCAO) and Ground Layer Adaptive Optics (GLAO) modes. In this paper we present the results obtained with SCAO and GLAO techniques using center of gravity for point-like sources and correlation algorithms for extended sources for different seeing conditions.

^{*}Speaker