

Characterizing and Upgrading of the Adaptive Optics Demonstrator

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Adaptive Optics (AO) is widely used for observational astronomy with ground-based telescopes. The main function of AO is to correct the distortion of images due to atmospheric turbulence. The AO demonstrator is a stand-alone system that operates with a 37-actuator Deformable Mirror (DM), a computer control system, a Shack-Hartmann wave front sensor, a science camera, optical lenses and mirrors, a video monitor, and a low-powered laser. This AO demonstrator shows the basic functionality of the AO system for educational purposes and provides hands-on training on how to troubleshoot and maintain an AO system. There are plans to upgrade the current AO set-up by adding one negative lens to fill the whole CCD of the science camera, to characterize the deformable mirror, and to expand the optical table. One of the primary concerns is to correct the amount of voltage in DM's actuators to set as the baseline in order to reach the mirror's optimum flatness. Flatness will be measured by using an interferometer, and will start to define the characteristics of the deformable mirror. By learning how to characterize the deformable mirror, we can test to measure the maximum stroke of the actuators.