Commissioning Status of the MAPS Adaptive Optics System on the MMT

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Abstract

The MMTO Adaptive optics exoPlanet characterization System (MAPS) is a new facility instrument being commissioned for the 6.5 meter MMT observatory. Funded by NSF-MSIP, MAPS features a complete redesign of the electronics and actuators for MMT's adaptive secondary mirror, a new wavefront sensing system with optical and near-infrared pyramid wavefront sensors, and upgrades to the Arizona infraRed Imager and Echelle Spectrograph (ARIES). The project aims to characterize the atmospheric composition of up to 100 exoplanets over a 60-night observation campaign. MAPS achieved first light in October 2022 and demonstrated closed-loop operation using an on-sky interaction matrix in January 2023, marking the first empirical calibration of an AO system at the MMT. We report on the on-sky commissioning efforts, including on-sky calibration, system performance, software development, and lessons learned.

Keywords: MAPS, pyramid, MMT, near infrared

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