
MAVIS: predictive Learn and Apply as a supervisory solution

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Abstract

Learn and Apply is a 2-step reconstruction scheme for Adaptive Optics (AO) instruments, and has recently been extended to include a predictive step, i.e., predictive Learn and Apply (pL&A). It estimates the pseudo-real-time atmospheric turbulence profile directly from the AO telemetry buffer (the so-called Learn step), and then performs tomographic reconstruction based on the outputs (the so-called Apply step). We implement the entire pL&A pipeline in end-to-end simulations, where both the Learn and the Apply steps are performed in turns. We present the results of these simulations, as well as the challenges that were encountered and overcome – in particular, the challenges which have had an impact on the design of the MAVIS AO module.

Keywords: Adaptive Optics, turbulence profiling, real, time control, predictive control, Learn and Apply

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