
Title: Doubled sky coverage, GeMS Upgrade NGS2 in operation

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Abstract

GeMS, the Gemini Multi Conjugated AO System GeMS is operational and regularly used for science observations since 2013 delivering close to diffraction limit resolution over a 2" field of view. Its original NGS WFS was delivering Tip-Tilt correction down to magnitude 15.5. In late 2019, in partnership with the Australian National University (ANU), we installed the NGS2 upgrade in the GeMS Canopus bench. NGS2 is based on an EMCCD detector observing the entire field of acquisition and allowing Tip Tilt and anisoplanatic correction based on the selection of up to 3 regions of interests (mROI) at 800Hz. We introduce the performance of this new system compared to the previous one. While we installed this upgrade, the Slow Focus Sensor integrated in the original NGSWFS was decommissioned. Measuring the relative drifts in the mean sodium altitude is now assumed by one of the Gemini Telescope Peripheral Wavefront Sensor, a 6x6 Shack Hartmann, called PWFS1. We review the hardware and software modifications we brought to PWFS1 to fulfill this new specialized role. The use of NGS2 and PWFS1 had profound implications on the GeMS operational model, we conclude by assessing those changes.

Keywords: MCAO, NGS WFS, Laser Slow focus sensor, operation

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