

PPPP on-sky experiment design

lundi 22 octobre 2018 10:00 (20 minutes)

Summary

For the next generation of extremely large telescopes with the primary mirrors over 30m in diameter, focal anisoplanatism renders single laser guide star AO useless. The laser tomography AO (LTAO) technique demonstrates an effective approach to reduce focal anisoplanatism, although it requires multiple LGSs & WFSs, and complex tomographic reconstruction. A novel LGS alternative configuration, termed Projected Pupil Plane Pattern (PPPP), associated with its corresponding wavefront sensing and reconstruction method has been demonstrated from Monte-Carlo simulation and a laboratory experiment. An on-sky experiment is now under design to verify this new technique, using a 1.8m telescope and 720W laser at 1064nm, including a site-related simulation, optical & hardware design and an implementation of SH WFS as a comparison.

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Classification de Session: Laser Guide Star