

Continuous-wave lidar method

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AO systems that sense focus using a LGS wavefront sensor cannot distinguish, in the signal received, between changes in atmospheric focus and changes of the sodium layer centroid altitude. Changes in the sodium centroid are falsely perceived as focus term changes, inducing wavefront errors that are proportional to the square of the telescope diameter. The continuous-wave lidar method yields line-of-sight sodium density profiles, derived from LGS by means of fast amplitude modulation of a continuous-wave laser. This method will be presented and a prediction of its performance on extremely-large telescopes will be given. An outlook on its application to existing or planned LGS-AO systems will be discussed.

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