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New generation of deformable mirror dedicated to ultra high intensity laser

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Like in astronomy, Adaptive Optics (AO) has recently become a standard feature at the modern ultra-high intensity lasers facilities. AO aims in reaching both maximum peak energy and intensity by correcting both the thermal effects induced in the amplification stages and aberrations induced by the optical components of the laser chain. The new generation of ultra-high intensity femto-second petawatt and above class lasers requires new features of wavefront corrections. New challenges for AO consist in overcoming the constraints of potentially bigger diameters, larger aberration strokes, faster optics, higher risk of damaging optical components and faster and easier maintenance.

Imagine Optic being a pioneer company in the development of AO solutions proposes HASO wavefront sensors, ILAO STAR deformable mirrors with control and analysis software WaveView Suite, dedicated to ultra-high intensity lasers. Here, we will present the new generation of deformable mirror, ILAO Star, which is using a new patented design of mechanical actuators.

We will present these new actuators and their improvements compared to the previous generation. We will put special attention to principles of actuation, design of deformable mirror and its complete characterization. We will also introduce the advantages brought by these new actuators when integrated in the ILAO Star deformable mirror. Main advantages are to reach a better mechanical efficiency and better thermal stability with a faster speed. Wide correction capabilities for beam diameter dimension from 20 mm to 500 mm useful diameter working from 0° to 45° angle of incidence are achievable. Easier and safer maintenance have been also proven by replaceable mechanical actuators keeping the deformable mirror membrane.

PRESENTATION AVAILABLE UPON DIRECT REQUEST AT AUTHOR'S ATTENTION AT nvarkentina@imagine-optic.com

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