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## Development of adaptive optics devices and methods for industrial applications at CNR-IFN

Adaptive optics devices can be exploited in many application fields. We will present our last developments in the application of adaptive lenses and deformable mirrors in ophthalmic imaging, microscopy and high power lasers.

For the correction of ocular aberrations in ophthalmic imaging and sample induced aberrations in microscopy, we exploited our multi actuator adaptive lens. In these applications, the aberrations are static and therefore we used an image based wavefront sensorless correction technique. We compared the performance of simple coordinate search correction and extreme learning algorithm.

We also demonstrated that adaptive lenses can correct dynamic aberrations when used with a fast Shack Hartmann wavefront sensor in closed loop. We applied the adaptive lens to correct for dynamic aberrations of high peak power femtosecond lasers demonstrating that the laser stability can be strongly increased.

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