# Experimental demonstration of a pupil-modulated PDI with broadband light.

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## Summary

In high-contrast adaptive optics systems, non-common path aberrations between the wavefront sensing and the science paths need to be highly corrected. To perform an improved calibration, we have developed the Calibration and Alignment Wavefront Sensor (CAWS), a pupil-modulated point-diffraction interferometer (m-PDI). Here we report the results of the integration of CAWS into CHOUGH, the Durham high-order adaptive optics system. Closed-loop experiments with static aberrations were performed with both monochromatic and polychromatic light. With monochromatic light, the residual error RMS is brought down to 55 nm across the entire pupil and 12 nm within a smaller area around the centre. Independently, PSF measurements showed Strehl ratio increases from 0.20 to 0.66. Preliminary broadband light tests with a FWHM of $\Delta\lambda$=12% (80 nm) also showed a reduction of residual errors and an improvement of Strehl, which proves the polychromatic capabilities of CAWS.

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