ID de Contribution: **27** Type: **Oral contribution**

Past, present and future of the generalized Optical Differentiation Wavefront sensor

lundi 22 octobre 2018 12:10 (20 minutes)

Summary

We have recently developed a new wavefront sensor with high-sensitivity and high-dynamic range, the generalized Optical Differentiation Wavefront sensor (g-ODWFS). These properties make it suitable for adaptive optic systems where a large range of phase aberrations have to be measured with high precision. The g-ODWFS is implemented with patterned liquid-crystals which make the wfs very efficient. The g-ODWFS has replaced the Shack-Hartmann wavefront sensor as our standard wavefront sensor in the Leiden EXoplanet Instrument (LEXI). I will show the first on-sky demonstration and the on-sky performance from our previous observing run in December 2017 on the William Herschel Telescope at La Palma. As LEXI is an high-contrast imager, we need to offload non-common path errors to the wavefront sensor for optimal performance. And because the g-ODWFS is an intrinsically non-linear wavefront sensor we may have to choose an operation point where the response is non-linear. To counter this we are developing a data-driven approach to non-linear wavefront reconstruction using convolution neural networks. I will show and discuss the results from simulations and lab work where we have successfully implemented neural networks that substantially improve the non-linear reconstruction error.

Auteur principal: M. HAFFERT, Sebastiaan (Leiden Observatory)

Orateur: M. HAFFERT, Sebastiaan (Leiden Observatory)

Classification de Session: Wave-Front Sensing Techniques