Date: 28/11/2013 at 12:30

Place: Auditorium

Author 1: Andreas Obereder

Title: The CuReD - Wavefront reconstruction for SH-WFS measurements

Abstract:

In this talk we will focus on a SCAO system equiped with a Shack-Hartmann wavefront sensor.For reconstructing incoming wavefronts from SH-WFS measurements we have developed the Cumulative Reconstructor with Domain decomposition (CuReD). This algorithm is comparable to the standard MVM approaches in terms of quality, but much faster in terms of reconstruction speed. The idea behind the CuReD will be presented, as well as some simulation results. We will also present first results on the reconstruction speed (measured reconstruction times).

Author 2: Iuliia Shatokhina:

Title: Preprocessed Cumulative Reconstructor with Domain Decomposition for XAO with Pyramid WFS

Abstract:

For extreme adaptive optics, we have studied theoretically the relation between data from pyramid and Shack-Hartmann wavefront sensors. From this research, a wavefront reconstruction algorithm called Preprocessed Cumulative Reconstructor with Domain decomposition (P-CuReD) has originated. The algorithm consists of two consequent steps - a data preprocessing, and an application of the CuReD algorithm. The simulation results show that the P-CuReD method provides the same reconstruction quality and is significantly faster than MVM. Details on the data preprocessing step will be presented.

Author 3: Mykhaylo Yudytskiy

Title: A Finite Element-Wavelet Hybrid Algorithm for MCAO and MOAO

Abstract:

Reconstruction of the refractive index fluctuations in the atmosphere, or atmospheric tomography, is an underlying problem of AO systems with multiple guide stars, such as MCAO and MOAO. In this talk we will present an algorithm based on the wavelet representation of the turbulence to solve the atmospheric tomography using the conjugate gradient iteration. The resulting Finite Element-Wavelet Hybrid Algorithm (FEWHA) is a method with linear complexity that is parallelizable and compact with respect to memory. We compare FEWHA in terms of quality to the MVM and FrIM and present the real-time computing capabilities of the method.