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Adaptive Optics without Wavefront Sensor for Low-Order Atmospheric Distortion

Master/Diploma Thesis at DLR (German Aerospace Centre), Institute of Communications and Navigation, Digital Networks Section, Optical Communications Group

- Duration: 6 to 8 months
- Start: July 2011 or later
- Requirements:
  - Students of Electrical Engineering, Physics or Computer Science
  - Experience with MatLab and Software Development (C/C++)
  - Desirable Experience in at least one of the following fields: Image Processing, Adaptive optics, wavefront sensing, atmospheric turbulence
  - Fluency in English
- Supervisor, Email: dirk.giggenbach@dlr.de  Tel. +49 8153 28 2821
- Short Description

Optical free-space communication (FSO) is strongly influenced by atmospheric turbulence, which induces distortions of the beam wave-front. The effects of these distortions can be mitigated by adaptive optics (AO) systems, as they are now used by astronomers.

At DLR a new AO method for wavefront correction without dedicated wavefront sensor has been developed which reduces system complexity and allows high processing speed. This method is limited to low-order distortions, i.e. the ratio of receiver aperture diameter to wavefront distortion pattern size is small, as it is usually the case in FSO systems.

In this work the new method shall be simulated numerically and its correction quality shall be tested under different atmospheric conditions to find the limits of its applicability. If time allows, a real setup can be tested in DLR’s AO lab testbed.


Contact Supervisor for more Details!

Closing date for Application: July 2011

Deutsches Zentrum für Luft- und Raumfahrt e.V. in der Helmholtz-Gemeinschaft

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