HIGHWIND : SIMULATION, OPTIMIZATION AND CONTROL

M. Diehl, *K.U. Leuven*

The ERC project "HIGHWIND – Simulation, Optimization and Control of High Altitude Wind Power Generators" at K.U. Leuven runs from 2011-2016. Its aim is to guide the development of the emerging technology from the modeling, optimization, and control side and to do only small scale experiments. Specifically, we develop and use ultra-fast embedded optimization for automatic control and state estimation, and we optimize and test intrinsically stable orbits (attractors) that alleviate the control tasks.

The hardware focus is on rigid wings, pumping power generation, and a novel way for automatic start and landing based on a rotation base, that as a by product allows indoors testing of our embedded control systems. Final aim is the automatic flight and startup of two balanced power planes, and the production of open-source software for the simulation, optimization and control issues of high altitude wind power.

The talk presents joint work with Jan Swevers, Dirk Vandepitte, Boris Houska, Reinhart Paelinck, Milan Vukov, Kurt Geebelen, Joris Gillis, and Mario Zanon.

MORITZ DIEHL
K.U. Leuven
Department of Electrical Engineering
ESAT/SCD, OPTEC

Kasteelpark Arenberg 10
bus 2446
3001 Heverlee
Belgium

moritz.diehl@esat.kuleuven.be
http://homes.esat.kuleuven.be/~mdiehl/

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