AERODYNAMIC DESIGN OPTIMIZATION OF SMALL WIND TURBINES

This research and development project focuses on the design optimization of an operational horizontal axis wind turbine.

The project starts from the Navier-Stokes COSA code developed by Dr. Campobasso's group and extensively validated for horizontal and vertical axis wind turbine flows, including the stall regulated NREL Phase VI turbine, which presents major similarities to the turbine considered in this project. The work will use state-of-the-art optimization tools to steer the high-fidelity CFD analyses towards an optimal design solution. Large supercomputing resources for the work, and the effect of manufacturing and assembly tolerances, will also be incorporated in the analyses. The project is in collaboration with a leading company developing and commercializing wind turbines.

Candidates should have a good background or track record in turbomachinery or open rotor fluid mechanics, experience with using CFD systems, some Python or MATLAB or FORTRAN or C/C++ skills and programming experience, and good communication and technical report writing skills. They should also have good interpersonal skills and be good team players.

The project duration is 9 months, with a possible extension to 12 months; the researcher will be based at the Engineering Department of Lancaster University, and a bursary to cover accommodation and sustenance costs is available. Project review meetings in Glasgow will take place and all costs of the appointed researcher to attend these meetings are covered by the project funds.

The project is an exciting opportunity for new Graduates wishing to gain experience in cutting-edge research in fluid dynamics and renewable energy, and to gain experience of working with industry, but it may also be suitable for outstanding Master students already holding a Bachelor Degree and willing to use part of this research work to prepare the Thesis for the final individual project of their Master Degree. If interested in obtaining further details and applying , please contact Dr. M. Sergio Campobasso at m.s.campobasso@lancaster.ac.uk , and send to him a) your CV indicating the Degrees you hold, b) the transcript of all exams you have taken, and c) contact details of two references.