

CFD ASSESSMENT OF WAVE LOADS ACTING ON TIDAL TURBINE BLADES

This research and development project focuses on the assessment of the structural loads acting on tidal turbine blades due to surface gravity waves. The tidal turbines under consideration are similar to multi-megawatt horizontal axis wind turbines. The project starts from the frequency-domain compressible Navier-Stokes COSA code developed by Dr. Campobasso's group and extensively validated for horizontal and vertical axis wind turbine flows. The code has recently been extended to incompressible flow problems. In this project, the recently developed incompressible flow capability will be validated and further improved, and then used for analysing unsteady tidal turbine flows due to surface gravity waves and compare computed results with available experimental data. The project is in collaboration with leading industrial partners in the tidal energy sector.

Candidates should have a good background or track record in turbomachinery or open rotor fluid mechanics, experience with using CFD systems, some FORTRAN or C/C++ or MATLAB 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, and should start in September 2017; 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 Bristol 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.