POSTDOCTORAL FELLOWSHIP IN CFD MODELLING OF SEABED-FLUID-STRUCTURE INTERACTION

Company Description

BCAM is the research center on applied mathematics created with the support of the Basque Government and the University of the Basque Country, which aims to strengthen the Basque science and technology system, by performing interdisciplinary research in the frontiers of mathematics, talented scientists' training and attraction, so the excellence of our results are recognized by the Society.

Information

- Deadline: 2019-08-20
- Category: Academia
- Province: Bizkaia
- Country: Basque Country
- City: Bilbao

Company

BCAM

Main functions, requisites & benefits

Main functions

Applications are invited for a postdoctoral position in the CFD group (Ikerbasque Prof. Marco Ellero) at BCAM. The focus of the project will be on the accurate modelling of the interaction of submerged structures with complex rheological fluids representing seabed sediments. The latter feature is critical for the stabilization of floating platforms (e.g. offshore wind turbines) and the design of improved anchoring technologies for marine applications. A novel aspect of this project will be represented by the simulation of the fluid-structure interaction with the soft soil phase. This is a complex liquid-solid material (e.g. sands, clay etc.) formed by a suspension of fine particles in water. A varying concentration of the dispersed phase can lead to different complex rheological behaviour ranging from yield-stress, shearthinning and viscoplastic effects. For a quantitative description of the full structure-fluid-seabed interaction problem, an accurate multiphase non-Newtonian model is required. The candidate will develop a multiphase model based on the meshless Smoothed Particle Hydrodynamics method to study several drag-embedded anchoring systems interacting with seabeds under different loading conditions. Simulation results will be validated against experimental data for scaled-down systems reproduced in the water tank facilities available at the Department of Fluid Mechanics at the University of the Basque Country (UPV/EHU). The project will be performed in collaboration with the Nuclear Engineering and Fluid Mechanics Department and the Geodynamics Department (UPV/EHU) and Tecnalia Research & Innovation.

Requisites

Promising young researchers. Applicants must have their PhD completed before the starting date. PhD degree preferable in Mechanical, Naval, Chemical Engineering, Physics or Applied Mathematics. Good communication and interpersonal skills. Ability to effectively communicate and present research ideas to researchers with different background (e.g., mathematicians and engineers). Ability to clearly present and publish research outcomes in spoken (talks) and written (papers) form. Good command of spoken and written English. Background in fluid mechanics, rheology, particulate systems or complex fluids. Experience in modelling and simulation of multiphase flows using meshless particle methods such as smoothed particle hydrodynamics (SPH) dissipative particle dynamics (DPD) or moving particle semi-implicit (MPS) methods. Knowledge of C/C++ or Fortran programming languages is required. Experience in parallel programming for HPC is desirable.

Benefits

There is a moving allowance for those researchers that come from a research institution outside the Basque Country from EUR 1,000 to EUR 2,000 gross. Free access to the Public Health System in Spain is provided to all employees.