

IST – EPFL Joint doctoral Initiative

Thesis Topic Proposal Form

TITLE: Mathematical modelling of geomorphic two-layer flows
FOCUS AREA: Environmental Hydraulics
Short Description

- The research is aimed at assembling and validating a numerical simulation tool for mixtures of fluid and sediment flowing within a different fluid environment; applications include underwater landslides generating tsunamis and density currents;
- The modelling work involves coding a novel geomorphic sub-model into an existing 2DH simulation tool;
- Laboratory work at EPFL is envisaged to collect data on mean flow and fluctuating quantities, as well as channel morphology;
- The resulting two-layer model will rely on an upscale approach to quantify the interaction between the different flow layers in terms of mass exchanges and apparent stresses.

Keywords: geomorphic flows, two-layer models, density currents, submarine landslides
SUPERVISORS

IST: Rui M.L. Ferreira

EPFL: Mário J. Franca

Doct. Program: Civil Engineering

Doct. Program: Civil and Environmental Engineering

 Planned start date: 1st February 2016

Start institution: IST