Invitation à la soutenance publique de thèse de
Madame Maria Angeliki SFOUNI GRIGORIADOU
Master in water resources and environment

Pour l’obtention du grade de Docteur en sciences de l’ingénieur et technologie

« Numerical modelling and experimental characterization of submarine slide-induced debris flows transitioning to turbidity currents »

qui se déroulera
le vendredi 31 août 2018 à 16h15
Auditoire MERC 14
Place Louis Pasteur, 3
1348 Louvain-la-Neuve

Membres du jury :

Prof. Benoit Spinewine (UCL/FUGRO), supervisor
Prof. Sandra Soares-Frazao (UCL), supervisor
Prof. Hervé Jeanmart (UCL), chairperson
Prof. Miltiadis Papalexandris (UCL), secretary
Prof. Athanassios Dimas (University of Patras, Greece)
Prof. Octavio Sequeiros (Shall Global, Rijswijk, NL)

The growth of the offshore renewable energy industry as well as the rapid technological advances in oil and gas production have forced the industry to access and mitigate geohazards in deep water environments and areas of steep seabed gradients susceptible to potential mass movement events such as debris flows and turbidity currents. The risks of such events may be ascertained using numerical models that predict their dynamic evolution from inception to runout. In the present work, a two-layer model is introduced to study the dynamics of a slide-induced debris flow gradually transforming into a turbidity current through sediment mixing and detrainment. It considers a dense viscoplastic debris flow layer at the bottom and a dilute turbidity current layer of variable density but Newtonian rheology at the top. The model proposes interfacial mass and momentum exchange mechanisms to account for friction and mixing between the debris layer, the turbid layer and the ambient, and handles emerging, vanishing or detaching layers. The generation and co-evolution of a turbidity current on top of a parent debris flow is investigated on an idealized slope-break bathymetry as well as on real bathymetry data. Two experimental campaigns have been performed to complement the study of the transition and co-existence of a debris flow and a turbidity current layer. Experimental results are compared with the numerical results of the introduced numerical model and provide a valuable database for future research.