Applied and Computational Mathematics Seminar

Title: Subgrid Processes for Storm Surge

Speaker: Andrew Kennedy (University of Notre Dame)

Date: Mon 21st October 2019 at 1:00PM

Location: Seminar Room SCN 1.25

Abstract: Averaging techniques are used to generate upscaled forms of the shallow water equations for storm surge including subgrid corrections. These systems are structurally similar to the standard shallow water equations but have additional terms related to integral properties of the fine-scale bathymetry, topography, and flow. As the system only operates with coarse-scale variables (such as averaged fluid velocity) relating to flow, these fine-scale integrals require closures to relate them to the coarsened variables. Closures with different levels of complexity are identified and tested for accuracy against high resolution solutions of the standard shallow water equations. Results show that, for coarse grids in complex geometries, inclusion of subgrid closure terms greatly improves model accuracy when compared to standard solutions, and will thereby enable new classes of storm surge models.

https://maths.ucd.ie/ACMSeminars/1920/kennedy.html