**Local time stepping schemes for global to coastal simulations in MPAS-Ocean**  
*Giacomo Capodaglio, Mark Petersen, Los Alamos National Laboratory*

One of the major challenges for the simulations of coastal processes is the presence of sharp horizontal gradients that require the use of grid cells with size of tens of meters to appropriately describe the physics. On the other hand, the phenomena occurring in the vicinity of the coast are very much tied to the ocean behavior at a global level. Multiresolution global ocean simulations are currently possible with MPAS-Ocean, although the largest time-step that allows stability is constrained by the size of the smallest cell in the grid, according to the CFL condition. To overcome this issue, a local time stepping scheme (LTS) specifically designed for MPAS-Ocean has been proposed by Hoang et al. (DOI:10.1016/j.jcp.2019.01.006). In this poster, I will report on a preliminary investigation of the performance of the LTS scheme by Hoang et al. applied to the MPAS-Ocean shallow water core. This preliminary study is meant to pave the way for a subsequent implementation of the aforementioned LTS scheme in the ocean core to allow realistic and efficient global to coastal ocean simulations.