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Parallel multigrid solvers in coastal ocean simulations

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This work aims to incorporate a parallel multigrid solver for the nonhydrostatic pressure with application to coastal ocean internal waves and baroclinic flows. This is accomplished by usage of two packages: the the Stanford Unstructured Nonhydrostatic Terrain-following Adaptive Navier-Stokes Simulator (SUNTANS) and the hypre linear solver package from Lawrence Livermore National Laboratory.

In this talk we discuss the implementation approach in joining these two codes, including specific parallel computing issues arising due to the use of z-level grids in SUNTANS. These grids are unstructured in the xy-plane, but structured in the z-direction. We include discussion of the parallel performance of the resulting SUNTANS+BoomerAMG code on the 500+ core cluster at Florida Tech.