

Applicability of AGRIF in the Regional Ocean Circulation Model

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Ocean circulation modeling demands versatile tools to enhance the accuracy and efficiency of regional models. Adaptive Grid Refinement In Fortran (AGRIF) is a library designed to seamlessly refine both spatial and temporal grids. This tool omits the procedure for generating boundary conditions from larger ocean models like MYOCEAN or HYCOM for child models, as it directly incorporates boundary values into the child model from the parent model during simulation. This feature also mitigates issues associated with abrupt changes in grid resolution between the parent and child models, ensuring a smoother connection between them when building high-resolution domains from a much smaller resolution. NEMO offers a variety of vertical coordinate options, including the z, sigma, and hybrid coordinates, which are all compatible with AGRIF. This study centers on a comparative analysis of traditional nesting methods, and the AGRIF approach in the NEMO model with two vertical coordinate systems (z-grid with partial step and hybrid sigma coordinate). By examining each configuration with the AGRIF module, our study aims to provide its applicability in regional ocean circulation modeling.