

PRESSURE FORCING AND TIME SPLITTING FOR DISCONTINUOUS GALERKIN APPROXIMATIONS TO LAYERED OCEAN MODELS

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This work concerns the application of DG methods to the numerical modeling of the general circulation of the ocean. One step performed here is to develop an integral weak formulation of the pressure forcing that is suitable for usage with a DG method and with a generalized vertical coordinate that includes level, terrain-fitted, and isopycnic coordinates as examples. The computation of pressure at cell edges is facilitated by some ideas that are also used for barotropic-baroclinic time splitting. This formulation is tested, in special cases, with some computational experiments and with analyses of well-balancing, dispersion relations, and numerical stability.

REFERENCES

- [1] R. L. Higdon. Pressure forcing and dispersion analysis for discontinuous Galerkin approximations to oceanic fluid flows. *Journal of Computational Physics*, Vol. **249**, 36–66, 2013.