A Geodesic Climate Model with Quasi-Lagrangian Vertical Coordinates

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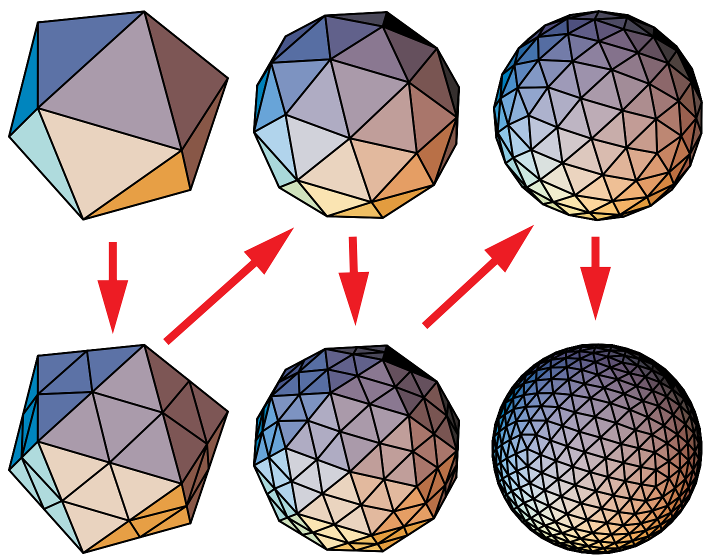
We are developing a geodesic coupled ocean-atmosphere-land surface model designed for climate applications. The atmosphere, ocean, and land-surface sub-models all use geodesic discretizations of the sphere, based on the icosahedron. The atmosphere and ocean GCMs



predict vorticity and divergence. We use a parallel multi-grid solver to solve for the stream function and velocity potential.

The vertical structures of the atmosphere and ocean are represented using quasi-Lagrangian vertical coordinates that minimize issues with vertical advection and have other advantages.