Lateral Boundary Condition Treatment in Limited Area Modeling

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Abstract

Limited area models can provide high resolution weather forecasts with much less computer resource requirements compared with global models. However, due to their limited-area nature lateral boundary conditions are necessary for those models. In general, there are three types of boundary conditions: open boundaries, one way interactions, and two way interactions. Open boundary conditions are generally for models that have no suitable boundary values, e.g., ocean current models. Two way interaction boundary conditions have not yet been able to demonstrated their advantages have not yet been able to demonstrated their advantages over one way interaction boundary conditions. One way interactions are still the most widely used boundary conditions in limited area models.

The talk will first review four different methods used in one way interaction boundary condition treatments, and demonstrate how those boundary condition treatments to either avoid overspecification of control boundary noises caused by the overspecification. Finally, some numerical experiment results will be presented to show the improvement in boundary condition treatments will significantly improve model performance in numerical weather prediction operations.