Numerical Implementation of the Multiple-Scale Model

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Abstract

In this poster, we will go over several challenges related to the numerical implementation of the multiple scale model (cf. other abstract). By definition of the multiple scale model, the planetary geostrophic solution and the quasi-geostrophic solution are defined on two different horizontal grids: a coarse grid PG and a fine grid for QG. For each grid, there are different spatial operators which must be constructed with care. A key point in the implementation of the QG model is the inversion of the 3D elliptic operator to recover the stream function from the vorticity field. This step is not trivial since the PV field contains both small scale and large scale variables. The numerical implementation of the model is validated with the analysis of Rossby wave dynamics.

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