Geophysical Research Abstracts
Vol. 15, EGU2013-8802, 2013
EGU General Assembly 2013

Oblique radiation lateral open boundary conditions for a regional climate atmospheric model

William Cabos Narvaez (1), Jose Antonio De Frutos Redondo (1), Juan Ignacio Perez Sanz (1), and Dmitry Sein (2)

(1) Universidad de Alcala, Dpto de Fisica, Alcala de Henares, Madrid, Spain (william.cabos@uah.es), (2) Max Planck Institute for Meteorology

The prescription of lateral boundary conditions in regional atmospheric models represent a very important issue for limited area models. The ill-posed nature of the open boundary conditions makes it necessary to devise schemes in order to filter spurious wave reflections at boundaries, being desirable to have one boundary condition per variable. On the other side, due to the essentially hyperbolic nature of the equations solved in state of the art atmospheric models, external data is required only for inward boundary fluxes. These circumstances make radiation lateral boundary conditions a good choice for the filtering of spurious wave reflections. Here we apply the adaptive oblique radiation modification proposed by Mikoyada and Roseti to each of the prognostic variables of the REMO regional atmospheric model and compare it to the more common normal radiation condition used in REMO. In the proposed scheme, special attention is paid to the estimation of the radiation phase speed, essential to detecting the direction of boundary fluxes. One of the differences with the classical scheme is that in case of outward propagation, the adaptive nudging imposed in the boundaries allows to minimize under and over specifications problems, adequately incorporating the external information.