

1112-65-491

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New avenues are explored for the numerical study of the two dimensional inviscid primitive equations of the atmosphere with humidity and saturation, in presence of topography and subject to physically plausible boundary conditions for the system of equations. A compatibility condition similar to that related to the condition of incompressibility for the Navier-Stokes equations, is introduced. In that respect, a version of the projection method is considered to enforce the compatibility condition on the horizontal velocity field, which comes from the boundary conditions. This is joint work with A. Bousquet, M. Chekroun, R. Temam, and J. Tribbia. (Received August 10, 2015)