

Seminar of numerical mathematics

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Far-field boundary conditions for incompressible stably stratified flows

Abstract

This numerical study presents the results of simulations of stably stratified wall-bounded flows. The effect of artificial far-field boundary conditions is studied in detail. The standard homogeneous Neumann condition for pressure is replaced by a non-homogeneous condition depending on local velocity and its gradient. The three-dimensional tests are performed for the case of flow over a low isolated hill. The simulations on computational domains with three different heights are discussed to evaluate the performance of the new far-field artificial boundary condition. The model is based on Boussinesq approximation of non-homogeneous Navier-Stokes equations, solved using artificial compressibility method, looking for a steady solution.

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