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Non-Boussinesq exchange flow over topography MAZIYAR
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versity of British Columbia, Vancouver, BC, Canada, GREGORY A. LAWRENCE,
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BC, Canada — A series of numerical simulations are performed for the "lock ex-
change" problem in a two-dimensional duct, where the density ratio of the two
phases is varied between 10 and 1000. A finite volume method based on an adaptive
Cartesian grid is used with grid refinement in regions of high vorticity and/or density
gradient. The physics of the problem is analyzed in detail, including wave forma-
tion, disturbance growth and the influence of the density ratio on flow features. The
results are compared with laboratory experiments, DNS, and theoretical predictions
(single and double -layer shallow water equations). The effects of introducing an
obstacle are also investigated.

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