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Buoyancy driven turbulent flows over irregular rough surfaces RAGHIB CHOWDHURY, ERIC RUIZ, KIRAN BHAGANAGAR, University of Texas, San Antonio — Density currents over irregular rough surfaces generated in lock-exchange mechanism have been simulated using direct numerical simulations. The surface roughness has been introduced using immersed boundary method. The governing Navier-stokes equations are solved in the vertical velocity-vertical vorticity formulation. The roughness has been characterized using statistical parameters. A preliminary analysis has been performed to understand the effect of surface roughness height on the evolution of the density currents generated in lock-exchange mechanism. The results have revealed density currents over rough wall travel at a lower speed compared to those over smooth wall. The front velocity and mixing have been characterized in terms of roughness parameters.

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