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Efficiency of mixing by heating or cooling in thermally stratified nonlinear spin-up[1] MELINE BAGHDASARIAN, ARTURO PACHECO-VEGA, California State University, Los Angeles, ROBERTO VERZICCO, Universita di Roma "Tor Vergata", J. RAFAEL PACHECO, SAP Americas — Spin-up (the transient flow of a fluid, either at rest or in solid body rotation, due to an increase in rotation rate), is particularly relevant to large-scale geophysical flows. Here we present numerical experiments of spin-up in a cylindrical container with shear-free upper boundary for four different thermal boundary conditions on the horizontal walls: (1) prescribed temperatures, (2) adiabatic conditions, (3) adiabatic on top and prescribed temperature on the bottom, and (4) prescribed temperature on top and adiabatic on the bottom. Studies on spin-up subjected to different boundary conditions and stratifications matter, as they may be helpful to understand the spin of water masses in basins for different physical scenarios. Most of the time, new water masses are formed at the surface by cooling, and their spin-up is clearly of utility in determining ensuing flow patterns. The focus here is on the efficiency of mixing due to spin-up when the horizontal boundaries are subjected to different thermal conditions.

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