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Inertial particles in turbulent convection VALENTINA LAVEZZO, HERMAN J.H. CLERCX, FEDERICO TOSCHI, Eindhoven University of Technology, Eindhoven, The Netherlands — Particle re-suspension mechanism in a non-isothermal flow has direct relevance for many industrial and environmental applications, where the properties of the flow (heat transfer, turbulence, etc.) can be modified by the presence of particles. A Lattice Boltzmann Method coupled with Lagrangian particle tracking is used to investigate the behaviour of inertial particles released in a horizontally periodic turbulent Rayleigh-Bénard convection cell. In particular, we focus on the effects of plume formation and turbulent structures on particle re-suspension in the domain. Different Froude numbers are considered to evaluate the influence of inertia and gravity on particle entrainment and dispersion. A two-way coupling approach has been included to estimate the impact of the presence of particles on the heat exchange between the two walls. Statistics revealed a close relationship between particle behaviour and fluid thermal structures and therefore a strong variation of the temperature field, when a back reaction of the particles onto the fluid is considered. Mean and higher order statistics on particle and fluid velocity and temperature fields are also presented.

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