Contribution ID: **9** Type: **Présentation orale**

Numerical modelling of rough Rayleigh-Bénard convection

We present direct numerical simulations of buoyant convection over a rough heated plate placed in a Rayleigh Bénard cell. The roughness is introduced by a set of cubic obstacles regularly spaced, modelled by using an immersed boundary method. This study aims at clarifying interactions between the large scale circulation filling the box, plume emission and the enhancement of the heat transfer. The simulations are performed in a box-shaped cell at fixed Prandtl number ($Pr = 4,38$) with the Rayleigh number Ra ranging from 10^5 to $5 \cdot 10^9$. As expected, results show an increase of heat transfer (measured by the Nusselt number Nu), when the mean thermal boundary-layer thickness becomes comparable with the obstacle height, in agreement with previous experimental and numerical studies from the literature.

Primary authors: BELKADI, Mebarek (LIMSI); SERGENT, Anne (UPMC / LIMSI); PODVIN, Bérengère (CNRS LIMSI)

Presenter: BELKADI, Mebarek (LIMSI)