

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Rayleigh-Bénard convection with side wall heating JUN ZHANG,
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NYU — As an important mechanism of heat transfer in fluids, Rayleigh-Bénard
convection (RBC) has been thoroughly studied in the past. In this talk, we examine
the effect of heating from one vertical sidewall in an otherwise classical RBC in a
cubic domain. With side heating introduced, experiment performed at high Rayleigh
number shows a decrease of Nusselt number, while the speed of large scale circulation
is enhanced due to the upwelling flow generated along the heated wall. Through the
measurement of thermal boundary layers, we find that their thickness at both the
top and bottom plates stay unaffected as long as the bottom heating power is fixed,
while the bulk temperature increases with the side heating. Since we have now a
non-isothermal boundary condition on the heated wall, we also discuss a modified
definition of Nu that takes into account of the heat injection from the side.

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Date submitted: 01 Aug 2017

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