

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Turbulent convection in a horizontal duct with strong axial magnetic field¹ XUAN ZHANG, OLEG ZIKANOV, University of Michigan - Dearborn
— Convection in a horizontal duct with one heated wall is studied computationally. The work is motivated by the concept of a blanket for fusion reactors, according to which liquid metal slowly flows in toroidal ducts aligned with the main component of the magnetic field. We first assume that the magnetic field is sufficiently strong for the flow to be purely two-dimensional and analyze chaotic flow regimes at very high Grashof numbers. Furthermore, three-dimensional perturbations are considered and the relation between the length of the duct and the critical Hartmann number, below which the flow becomes three-dimensional, is determined.

¹Financial support was provided by the US NSF (Grant CBET 1232851).

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Date submitted: 01 Aug 2014

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