Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Vortex shedding patterns, their competition, and chaos in flow past inline oscillating rectangular cylinders[1] SRIKANTH TOPPALADODDI, Department of Geology and Geophysics, Yale University, HARISH N. DIXIT, Mathematics Department, University of British Columbia, RAO TATAVARTI, Department of Civil Engineering, Gayatri Vidya Parishad College of Engineering, India, RAMA GOVINDARAJAN, Engineering Mechanics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, India — Different vortex shedding patterns arising in the flow past inline oscillating rectangular cylinders, at a Reynolds number of 200 is studied numerically in two-dimensions. The S-II mode of symmetric shedding, discovered in 2006, as well as the Couder-Basdevant mode [J. Fluid Mech. 173, 225-251 (1986)], seen in experiments earlier, are found numerically for the first time. Besides, a new mode of symmetric shedding, named here as S-III, is also reported. Chaotic flow in the wake of a circular cylinder, recently reported by Perdikaris *et al.* [Phys. Fluids 21(10), 101705 (2009)] is also seen in flow past the rectangular geometries here, and we show that this is indeed due to mode competition, between antisymmetric and symmetric modes of vortex shedding, in the sense of Ciliberto & Gollub [Phys. Rev. Lett. 52, 922 (1984)]. A global and reliable parameter has been constructed to "quantify" this chaos. The Lattice Boltzmann Method (LBM) has been used to solve for the flow.

[1]The Naval Physical and Oceanic Labs, Kochi are gratefully acknowledged for a grant which enabled this work to begin.

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Date submitted: 15 Aug 2011 Electronic form version 1.4