Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Non-local features of a hydrodynamic pilot-wave system ANDRE NACHBIN, IMPA/Brazil, MILES COUCHMAN, JOHN BUSH, Math. Dept./MIT — A droplet walking on the surface of a vibrating fluid bath constitutes a pilot-wave system of the form envisaged for quantum dynamics by Louis de Broglie: a particle moves in resonance with its guiding wave field. We here present an examination of pilot-wave hydrodynamics in a confined domain. Specifically, we present a one-dimensional water wave model that describes droplets walking in single and multiple cavities. The cavities are separated by a submerged barrier, and so allow for the study of tunneling. They also highlight the non-local dynamical features arising due to the spatially-extended wave field. Results from computational simulations are complemented by laboratory experiments.

Andre Nachbin
IMPA/Brazil

Date submitted: 01 Aug 2016 Electronic form version 1.4