

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Relative equilibria in rotating shallow water layer: a real fluid case of point vortex theory MOHAMED FAYED, Department of Mechanical and Industrial Engineering, Concordia University, Montreal, Quebec, Canada, HAMID AIT ABDERRAHMANE, King Abdullah University of Science and Technology (KAUST), HOI DICK NG, GEORGIOS H. VATISTAS, Department of Mechanical and Industrial Engineering, Concordia University, Montreal, Quebec, Canada — The present work deals with the question whether or not the regular equilibrium structures, consisting of two and three vortices in rotating shallow water layer, produced inside a cylindrical container with a revolving disk at the bottom, represent real fluid cases of the old point vortex theory. Despite an attempts made by some researchers to address this question, the answer is yet to be clarified. Based on the data from our experiments we show that the observed vortex-pattern do retain the fundamental characteristics of Kevin's equilibria that can be adequately described by the classical idealized point vortex theory. Equivalently, we demonstrate that the experimental results found in recent literature, if properly interpreted, lead to the same conclusion.

Hamid Ait Abderrahmane
King Abdullah University of Science and Technology (KAUST)

Date submitted: 09 Aug 2012

Electronic form version 1.4