

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**A laboratory study of floating lenticular anticyclones<sup>1</sup>** PATRICE LE GAL, IRPHE - Aix Marseille University - CNRS, HECTOR DE LA ROSA, ANNE CROS, RAÚL CRUZ-GOMEZ, Instituto de Astronomía y Meteorología, Departamento de Física, Universidad de Guadalajara, MICHAEL LE BARS, IRPHE - Aix Marseille University - CNRS — Oceanic vortices play an important role in the redistribution of heat, salt and momentum in the oceans. Among these vortices, floating lenses or rings are often met in the meanders of warm currents. For instance the North Brazil Current rings are among the most intense and large anticyclonic vortices on Earth. In order to better describe these vortices, we propose here a laboratory study of these floating anticyclonic lenses. A blob of fresh water is slowly injected near the surface of a rotating layer of homogeneous salted water. Because of the opposite effects of rotation that tends to generate columnar structures and density stratification that spreads light water on the surface, the vortices take a finite size three dimensional typical shape. Visualization and PIV measurements of the shape, aspect ratios and vorticity profiles are compared to analytical predictions that use first a simple solid body rotation model and then a more realistic isolated Gaussian vorticity field inside the anticyclones.

<sup>1</sup>This work was carried out within the framework of a bilateral cooperation between CNRS (France) and CONACYT (Mexico)

Patrice Le Gal  
IRPHE - Aix Marseille University - CNRS

Date submitted: 31 Jul 2014

Electronic form version 1.4