

Abstract Submitted  
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**Baroclinic turbulence on a polar beta-plane by Altimetric Imaging Velocimetry: laboratory experiments** YAKOV AFANASYEV, Memorial University of Newfoundland, PETER RHINES, ERIC LINDAHL, University of Washington — A new method of optical altimetry with color coding was designed for measuring the slopes of the free surface elevation field and calculation of geostrophic velocity field. The examples of baroclinic flows on a rapidly rotating turntable will be demonstrated and discussed. The flows are created by releasing lighter fluid on the surface of the rotating layer or at the interface between the two layers. The surface of the rapidly rotating layer is of the form of a paraboloid which creates a dynamical effect of a polar beta-plane. The evolving turbulent flows include vortices, beta gyres, multiple zonal jets and Rossby waves. The geostrophic velocity, vorticity and surface elevation are measured by AIV with very high resolution of typically several million vectors. Two-dimensional spectra are documented and the features of these flows are discussed.

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