Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

**Swirling plumes and spinning tops** DARIA FRANK, University of Cambridge, JULIEN LANDEL, University of Manchester, STUART DALZIEL, PAUL LINDEN, University of Cambridge — Motivated by potential effects of the Earth's rotation on the dynamics of the oil plume resulting from the Deepwater Horizon disaster in 2010, we conducted laboratory experiments on saltwater and bubble axisymmetric point plumes in a homogeneous rotating environment. The effect of rotation is conventionally characterized by a Rossby number, based on the source buoyancy flux, the rotation rate of the system and the total water depth and which ranged from 0.02 to 1.3 in our experiments. In the range of parameters studied, we report a striking new physical instability in the plume dynamics near the source. After approximately one rotation period, the plume axis tilts away laterally from the centreline and the plume starts to precess in the anticyclonic direction. We find that the mean precession frequency of the plume scales linearly with the rotation rate of the environment. Surprisingly, the precession frequency is found to be independent of the diameter of the plume nozzle, the source buoyancy flux, the water depth and the geometry of the domain. In this talk, we present our experimental results and develop simple theoretical toy models to explain the observed plume behaviour.

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Date submitted: 29 Jul 2017 Electronic form version 1.4