Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

The effect of bottom friction on tidal dipolar vortices and the associated transport[1] MATIAS DURAN-MATUTE, LEON KAMP, GERTJAN VAN HEIJST, Eindhoven Univ of Tech — Tidal dipolar vortices can be formed in a semi-enclosed basin as the tides flow in and out through an inlet. If they are strong enough to overcome the opposing tidal currents, these vortices can travel away from the inlet due to their self-propelling mechanism, and hence, act as an efficient transport agent for suspended material. We present results of two-dimensional numerical simulations of the flow through an idealized tidal inlet, with either a linear or a nonlinear parameterization of the bottom friction. We then quantify the effect of the bottom friction on the propagation of the dipolar vortex and on its ability as a transport agent by computing the flushing and residence times of passive particles. Bottom friction is detrimental to the ability of tidal dipolar vortices to propagate and hinders transport away from the inlet. The magnitude of this effect is related to the relative duration of the tidal period as compared to the typical decay time scale of the vortex dipole.

[1]This research is funded by NWO (the Netherlands) through the VENI grant 863.13.022

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Date submitted: 31 Jul 2016 Electronic form version 1.4