Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Numerical study of water flow in a system of two basins connected by a channel with periodic forcing ERICK JAVIER LOPEZ SANCHEZ, GERARDO RUIZ CHAVARRIA — In oceanography the transport of particles is a frecuent phenomenon, for instance ocean currents carry the plankton from one place to another. In shallow waters drag and deposition of sand can affect positively or negatively certain human activities, such as the navigation near the coast; on the other hand, sand banks can help to mitigate the force with which a tsunami approaches a populated coastline. We study the flow of water in a system of two basins connected by a channel, generated by a periodic forcing that simulates the tidal force. The simulation is done by solving the system of equations in stream function (ψ) - vorticity (ω) formulation, obtained from the Navier-Stokes and continuity in two dimensions. A pseudo-spectral method based on polynomials Chebyshev is used. The tidal forcing is reflected in the fact that Reynolds number becomes time dependent. We obtained results that are consistent with previous works (like: Wells, M. G. and Van Heijst, G.J.F., *Dynamics of Atmospheres and Oceans*, **37** (2003) 223-244). For example the formation and displacement of a dipole at the exit of the channel is observed. The velocity field obtained numerically is used to study the transport of particles by the flow, where the dipole moves away from the channel output or return to it, depending on the geometry of the system and period occurrence of the phenomenon.

Erick Javier Lopez Sanchez

Date submitted: 06 Aug 2010 Electronic form version 1.4