1093-65-296 **Louis F Rossi*** (`rossi@math.udel.edu`), Department of Mathematical Sciences, Newark, DE 19716. *Visualizing Vorticity: Using BlobFlow to study the inverse cascade.*

The inverse cascade refers to the relaxation of chaotic distributions of vorticity into a small number of concentrated regions of vorticity under the dynamics of the two-dimensional Navier-Stokes equations. A small number of analytical results and a larger body of computational results suggest that the vorticity field should relax into a small number Lamb-Oseen monopoles surrounded by vast regions of irrotational fluid. The majority of computational studies are limited to periodic boundary conditions with hyperviscosity. The elliptical corrected core spreading vortex method (ECCSVM) is a different approach that captures the viscous Navier-Stokes equations on unbounded domains using high order elliptical Gaussian basis functions. We present new BlobFlow calculations demonstrating the emergence of stable coherent dipoles from disordered initial conditions. BlobFlow is an open, parallel implementation of ECCSVM that facilitates accurate extended calculations of vorticity fields. One of the challenges of using meshfree methods is a dearth of friendly tools for exploring results that are representation as linear combinations of anisotropic basis functions. We present a new tool for visualizing and sharing meshfree, computational results over the internet. (Received August 19, 2013)