DATE CHANGE

Geophysical Turbulence Program Seminar

National **C**enter for **A**tmospheric **R**esearch

Generalized Eulerian-Lagrangian description of Navier-Stokes dynamics

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Abstract:

Generalized equations of motion for the Weber-Clebsch potentials that reproduce Navier-Stokes dynamics are derived. These depend on a new parameter, with the dimension of time, and reduce to the Ohkitani and Constantin equations in the singular special case where the new parameter vanishes.
Let us recall that Ohkitani and Constantin found that the diffusive Lagrangian map became noninvertible under time evolution and required resetting for its calculation. They proposed that high frequency of resetting was a diagnostic for vortex reconnection.
Direct numerical simulations of the generalized equations of motion are performed. The Navier-Stokes dynamics is well reproduced at small enough Reynolds number without resetting. Computation at higher Reynolds numbers is achieved by performing resettings. The interval between successive resettings is found to abruptly increase when the new parameter is varied from zero to a value much smaller than the resetting interval.

When:
20 February, 2007
Tuesday, 2pm (refreshments at 3pm)

Where:
Mesa Laboratory, Chapman Room

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