

1049-35-194

**Jesenko Vukadinovic\*** (vukadino@math.csi.cuny.edu), 2800 Victory Boulevard, College of Staten Island, Staten Island, NY 10314. *Inertial manifolds for a class of Burgers' and nonlinear Fokker-Planck equations*. Preliminary report.

The spectral-gap condition has long been the constraint that stalled a lot of the development of the theory of inertial manifolds, as most of the physically relevant dissipative parabolic differential equations fail to satisfy it. A Cole-Hopf-like transformation is used to circumvent the spectral-gap condition by transforming a class of Burgers' and nonlinear Fokker-Planck equations into a form suitable for the application of the theory of inertial manifolds. The systems which can be handled in this way are the Smoluchowski equation arising in the theory of nematic polymers, as well as the Burgers-Sivashinsky equation and the Quasy-Steady equation of cellular flames, which are closely related to Kuramoto-Sivashinsky equations. The procedure works in both one and two space dimensions. (Received March 03, 2009)