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Susan Kurien, Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM 87544, **Evelyn Lunasin**, Department of Mathematics, University of California, Irvine, CA 92697-3875, **Mark A. Taylor**, Department of Exploratory Simulation Technolo, Sandia National Laboratory, Albuquerque, NM 87185, and **Edriss S. Titi*** (etiti@math.uci.edu), Department of Mathematics, University of California, Irvine, CA 92697-3875. *A study of the Navier-Stokes- α model for two-dimensional turbulence.*

The Navier-Stokes- α model of turbulence is a mollification of the Navier-Stokes equations in which the vorticity is advected and stretched by a smoothed velocity field. The smoothing is performed by filtering the velocity field over spatial scales of size smaller than α . In this talk we will derive, using analytical arguments, power laws for the energy spectra of the various α -models. We will support our analytical findings by computational study of the two-dimensional Navier-Stokes- α model. (Received August 14, 2007)