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**Anna L Mazzucato\*** ([alm24@psu.edu](mailto:alm24@psu.edu)), Mathematics Department, Pennsylvania State University, University Park, PA 16802. *On the energy spectrum for weak solutions of the Navier-Stokes equation.*

We study the decay at high wavenumber of the energy spectrum for weak solutions of the 3D Navier-Stokes equation. Known regularity results imply solutions are regular if the spectrum decays algebraically sufficiently fast. We allow for infinite-energy solutions by localizing the equation. We consider certain modified Leray self-similar solutions and show that their spectrum decays exactly at the critical rate, which is then consistent with the appearance of an isolated singularity. (Received February 05, 2006)