1078-35-325 **Susan Friedlander*** (susanfri@usc.edu), Math Dept, USC, Los Angeles, CA 90089, and **Walter Rusin** (wrusin@usc.edu) and **Vlad Vicol** (vicol@math.uchicago.edu). *An active scalar equation with supercritical fractional diffusion.*

We address the well/ill posedness of the magnetogeostrophic equation with supercritical fractional diffusion. There is a striking loss of regularity when the fractional power drops below 1/2. This happens because the constitutive law used to obtain the velocity from the active scalar is given by an unbounded Fourier multiplier which is both even and anisotropic. (Received December 12, 2011)