

1064-35-310

**Susan Friedlander\*** ([susanfri@usc.edu](mailto:susanfri@usc.edu)), USC Dept of Math KAP 108, 3620 S Vermont Avenue, Los Angeles, CA 90089, and **Vlad Vicol**. *Active Scalar Equations and a Geodynamo Model*.

We discuss an advection-diffusion equation that has been proposed by Keith Moffatt as a model for magnetogeostrophic turbulence in the Earth's fluid core. This nonlinear PDE (MG) has certain similarities to the critical surface quasi-geostrophic equation (SQG), however it also has some crucial differences. Inspired by the recent work of Caffarelli and Vasseur for the SQG equation, we use De Giorgi techniques to prove Holder continuity for a class of active scalar equations where the divergence free velocity is the derivative of a singular integral operator. This general result implies that solutions to the MG equation are smooth globally in time. (Received September 13, 2010)