1112-76-468 **Robert Hardt*** (`hardt@rice.edu`), Mathematics Department-MS 136, Rice University, PO Box 1892, Houston, TX 77251-1892. *Line Defects in a Modified Ericksen Model.* Preliminary report.

In 1985, J. Ericksen proposed a model for uniaxial liquid crystals to explain disclinations (i.e. line defects or curve singularities). It involved not only a unit orientation vectorfield on a region of $\mathbb{R}^3$ but also a scalar function giving a local probability of orientation order. FH. Lin, in several papers, related this model to harmonic maps to a metric cone over $\mathbb{S}^2$ and studied the regularity of minimizers. The optimal partial regularity result of R.Hardt-FH.Lin in 1993 unfortunately excluded line singularities. This paper accordingly introduced a modified model involving a metric cone over $\mathbb{RP}^2$, the real projective plane. Here the nontrivial homotopy leads to the optimal estimate of the singular set being 1 dimensional. In 2010, J. Ball and A.Zarnescu discussed a derivation from the de Gennes Q tensor and interesting orientability questions using $\mathbb{RP}^2$. In recent ongoing work with FH.Lin and T. Huang, we see that the disinclination set necessarily consists of Hölder continuous curves. (Received August 10, 2015)