1035-35-258 **Parimah T Kazemi*** (pk0010@unt.edu), University of North Texas, Department of Mathematics, P.O. Box 311430, Denton, TX. *A constructive method for finding critical points of a Ginzburg-Landau type functional.*

In this project we look for critical points of the equation, $\phi(u) = \int_\Omega \frac{|\nabla u|^2}{2} + \frac{\kappa^2(|u|^2-1)^2}{4}$. This functional gives a special case of a Ginzburg-Landau functional. Here Ω is a bounded region in $\Re^2$ that has the cone property and $u \in H = H^{1,2}(\Omega, C)$. Define the Sobolev gradient, $\nabla_S \phi(u)$, to be the member of H so that $\phi'(u)(h) = \langle (h), \nabla_S \phi(u) \rangle_H$ for all $h \in H$. We show that there exists $u \in H$ so that $\nabla_S \phi(u) = 0$ and that this critical point is obtained using continuous steepest descent with the Sobolev gradient. (Received September 09, 2007)