1023-49-1415 **Dmitry Golovaty*** (Dmitry@math.uakron.edu), Department of Theoretical and, Applied Mathematics, The University of Akron, Akron, OH 44124-4002, and **Leonid Berlyand** and **Volodymyr Rybalko**. *Capacity of a Multiply-connected Domain and Nonexistence of Ginzburg-Landau Minimizers with Prescribed Degrees on the Boundary.*

Suppose that $\omega \subset \Omega \subset \mathbb{R}^2$. In the annular domain $A = \Omega \setminus \bar{\omega}$ consider the class $\mathcal{J}$ of complex valued maps having degree 1 on $\partial\Omega$ and $\partial\omega$. It has been conjectured by Berlyand and Mironescu that the existence of minimizers of the Ginzburg-Landau functional E_κ over $\mathcal{J}$ is controlled by the capacity of the domain A. The existence has been previously demonstrated for all values of the Ginzburg-Landau parameter κ when $\text{cap}(A) \geq \pi$ (domain A is "thin") and for small κ when $\text{cap}(A) < \pi$ (domain A is "thick").

Here we prove that, when $\text{cap}(A) < \pi$, there exists a *finite* critical value κ_1 of κ such that the minimum of E_κ is *not* attained in $\mathcal{J}$ when $\kappa > \kappa_1$ while it is attained when $\kappa < \kappa_1$. (Received September 26, 2006)