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An orthogonality condition for minimizers of a Ginzburg-Landau functional

In this work, minimizers of the Ginzburg-Landau functional with associated length scale parameter $\varepsilon > 0$ are studied over a bounded simply-connected domain $\Omega \subset \mathbb{R}^2$ with smooth boundary $\partial\Omega$. Along the boundary, minimizers u_ε are to satisfy the orthogonality condition $\langle u_\varepsilon, g^\perp \rangle = 0$ where g is a smooth $\mathbb{S}^1$-valued function of degree $d \in \mathbb{Z} \setminus \{0\}$ defined on $\partial\Omega$. We will discuss some properties of minimizers and analyze their limiting behaviour along a subsequence $\varepsilon_n \to 0$.