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*Irreducible Ginzburg–Landau Fields in dimension 2*

Ginzburg–Landau fields are the solutions of the Ginzburg–Landau equations which depend on two positive parameters,  $\alpha$  and  $\beta$ . We give conditions on  $\alpha$  and  $\beta$  for the existence of irreducible solutions of these equations. Our results hold for arbitrary compact, oriented, Riemannian 2-manifolds (for example, bounded domains in  $\mathbb{R}^2$ , spheres, tori, etc.) with de Gennes–Neumann boundary conditions. We also prove that, for each such manifold and all positive  $\alpha$  and  $\beta$ , Ginzburg–Landau fields exist for only a finite set of energy values and the Ginzburg–Landau free energy is a Palais–Smale function on the space of gauge equivalence classes.