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Ginzburg-Landau Vortices

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Book Condition: New. Publisher/Verlag: Springer, Basel | The original motivation of this study comes from the following questions that were mentioned to one ofus by H. Matano. Let 2 2 G= B = . 1 Consider the Ginzburg-Landau functional 2 2 (1) E~(u) = ~ LlVul + 4~2 L(lu1 _1)2 which is defined for maps u E H1(G;C) also identified with Hl(G;R2). Fix the boundary condition 9(X) =X on 8G and set H; = . It is easy to see that (2) is achieved by some u~ that is smooth and satisfies the Euler equation in G, -~u~ = :2 u~(1 _lu~12) (3) { on aGo u~ =9 Themaximum principleeasily implies (see e.g., F. Bethuel, H. Brezisand F. Helein (2]) that any solution u~ of (3) satisfies lu~1 ~ 1 in G. In particular, a subsequence (u~,.) converges in the w - LOO(G) topology to a limit u . | I. Energy estimates for S1-valued maps.- 1. An auxiliary linear problem.- 2. Variants of Theorem I.1.- 3. S1-valued harmonic maps with prescribed isolated singularities. The canonical harmonic map.- 4. Shrinking holes. Renormalized energy.- II. A lower bound for the energy of S1-valued maps on perforated domains.- III. Some basic estimates...

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