## LOCAL MINIMIZERS FOR BOUNDARY REACTIONS: RENORMALIZED ENERGY AND APPLICATIONS

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ABSTRACT. We consider scalar solutions of reaction-diffusion equations associated to the following energy: Dirichlet energy in the interior plus potential energy on the boundary. Solutions are harmonic functions in the interior satisfying a semilinear Neumann boundary condition. The energy potential is of double-well type, and as its strength tends to infinity, solutions in 2D develop boundary singularities or vortices. We determine their location on the boundary through a renormalized energy à la Bethuel-Brezis-Helein for the complex Ginzburg-Landau equation. As an application, we prove existence of nonconstant stable solutions in certain convex planar domains.

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