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Erratum

Erratum to: On the Ginzburg–Landau Functional in the Surface Superconductivity Regime

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Through the refereeing process of a follow-up paper [1], we became aware of a mistake that affects the statement and proof of one of the main results (Theorem 2.4) formulated in the original article. In addition, some heuristic discussion has to be modified accordingly, but the other results are unaffected.

The mistake originated from the change of gauge described in Proposition 4.1, which is associated with the extraction of some suitable phase $\phi_\varepsilon(s, t)$ from the Ginzburg–Landau order parameter. Such a phase factor was unintentionally dropped in the rest of the discussion, generating the mistake mentioned above. To give an explicit example, the heuristic behavior of the order parameter in (1.16) must be replaced with

$$\Psi^{\mathrm{GL}}(\mathbf{r}) \approx f_0\left(\tfrac{\eta}{\varepsilon}\right) \exp\left(-i\alpha_0 \tfrac{\xi}{\varepsilon}\right) \exp\left(i\phi_\varepsilon\left(\tfrac{\xi}{\varepsilon}, \tfrac{\eta}{\varepsilon}\right)\right). \tag{1.16}$$

We omit the extensive list of such corrections and refer to the revised version of the original paper [2]. For the sake of clarity we present, however, the correct statement of Theorem 2.4:

Theorem 2.4 (Winding number of Ψ^{GL} on the boundary of disc samples). *Let Ω be a disc of radius $R = k^{-1}$. For any $1 < b < \Theta_0^{-1}$ as $\varepsilon \to 0$, any GL minimizer Ψ^{GL} satisfies*

$$\deg\left(\Psi^{\mathrm{GL}}, \partial\Omega\right) = \frac{\pi R^2}{\varepsilon^2} + \frac{|\alpha_k|}{\varepsilon} + \mathcal{O}(\varepsilon^{-3/4}|\log\varepsilon|^2). \tag{2.11}$$

References

1. Correggi, M., Rougerie, N.: Boundary behavior of the Ginzburg-Landau order parameter in the surface superconductivity regime. Arch. Rational Mech. Anal. (2014, to appear). arXiv:1406.2259 [math-ph]
2. Correggi, M., Rougerie, N.: On the Ginzburg-Landau functional in the surface superconductivity regime. (2014). arXiv:1309.2268 [math-ph]