Hydrodynamic limit for the Ginzburg-Landau $\nabla\phi$ interface model with both a conservation law and the Dirichlet boundary condition

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We discuss the hydrodynamic scaling limit for the interface motion preserving its volume. For the dynamics on d-dimensional torus, the nonlinear fourth-order partial differential equation

$$\frac{\partial h}{\partial t} = -\Delta \mathrm{div}\{(\nabla\sigma)(\nabla h)\}$$

is derived as the macroscopic equation in [N. 2002], where $\sigma : \mathbb{R}^d \to \mathbb{R}$ is the function so called "surface tension." The aim of this talk is to discuss the properties the interface motion preserving its volume under the Dirichlet boundary condition, and to derive the macroscopic equation under this setting. Furthermore, the relationship between the macroscopic equation and the Wulff shape derived by [Deuschel-Giacommin-Ioffe, 2001] will be also discussed.