POSTER

A degenerate Cahn-Hilliard model as constrained Wasserstein gradient flow

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Abstract
We derive a phase field model for incompressible immiscible two-phase flows as the Wasserstein gradient flow of the Cahn-Hilliard energy. The cost of each phase motion is related to a classical squared Wasserstein distance, and a constraint enforces the sum of the concentration to be equal to 1. This model shares important features with classical models of porous media flows [1] and differs from the classical degenerate Cahn-Hilliard model. [3]. The existence of a solution to the problem is proved thanks to the convergence of the JKO approximation scheme. [4]. Numerical simulations using a nonlinearly stable finite volume scheme [2] are finally provided.

Keywords. Degenerate Cahn-Hilliard model, constrained Wasserstein gradient flow

References


