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A variational level set methodology without reinitialization for predicting equilibrium interfaces over arbitrary textured surfaces[1] KARIM ALAME, SREEVATSA ANANTHARAMU, KRISHNAN MAHESH, University of Minnesota — A robust numerical methodology to predict equilibrium interfaces over arbitrary solid surfaces is developed. The kernel of the proposed method is the distance regularized level set equations (DRLSE) with techniques to incorporate the no-penetration and mass-conservation constraints. In this framework, we avoid reinitialization typically used in traditional level set evolution algorithms. The method is second-order accurate and requires only central difference schemes. The application of the method, in the context of Gibbs free energy minimization, to obtain liquid-air interfaces is validated against existing analytical solutions. The capability of our current methodology to predict equilibrium shapes over both structured and realistic rough surfaces is demonstrated.

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