

Abstract Submitted
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A Dissipative Particle Dynamics model for two-phase flows ANUPAM TIWARI, JOHN ABRAHAM, School of Mechanical Engineering, Purdue University, West Lafayette, IN 47907 — A Dissipative Particle Dynamics (DPD) model for two-phase flows is presented. The new model, unlike existing models [1, 2], uses different cut-off radii for the attractive and repulsive components of the inter-particle interaction potential and allows for larger density ratios between the phases. Surface tension arises due to the attractive component and a forcing term that depends on higher order density gradients. The model is shown to reproduce the Laplace law and analytical results for drop oscillations. A new method that couples a Lennard-Jones type potential with a coarse-grained potential is also presented.

References:

- [1] Pagonabarraga, I. and Frenkel, D. (2001). *Journal of Chemical Physics*, 115(11): 5015-5026.
- [2] Warren, P.B. (2003). *Physical Review E*. 68. 066702: 1-8.

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