Invited: SPCS-I-06

Finite-Size Scaling at the Droplet Condensation-Evaporation Transition

Johannes Zierenberg and Wolfhard Janke
Institut für Theoretische Physik,
Universität Leipzig, Postfach 100920, D-04009 Leipzig, Germany

The talk gives an overview of our recent finite-size scaling analyses of the droplet condensation-evaporation transition at fixed density of a lattice gas in two and three dimensions and a Lennard-Jones gas in three dimensions [1]. The numerical data are obtained in extensive computer simulations employing a parallelized implementation [2] of the multicanonical method. In the limit of large system sizes, the theoretical leading-order scaling predictions for both the transition temperature and the finite-size rounding are verified. In addition, we identified an emerging intermediate crossover scaling regime, consistent in all considered cases with similar observations in a recent study of polymer aggregation [3]. The talk concludes with a few remarks on the special properties of the nucleation process of rather stiff polymers [4].

References:

1. J. Zierenberg and W. Janke, Phys. Rev. E 92, 012134 (2015).
2. J. Zierenberg, M. Marenz, and W. Janke, Comput. Phys. Comm. 184, 1155 (2013).
3. J. Zierenberg, M. Mueller, P. Schierz, M. Marenz, and W. Janke, J. Chem. Phys. 141, 114908 (2014).
4. J. Zierenberg and W. Janke, Europhys. Lett. 109, 28002 (2015).