

Abstract Submitted  
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**Finite Size Scaling of Melting in Two Dimensions** KEOLA WIERSCHEM, MARTECH & Department of Physics, Florida State University, EFS-TRATIOS MANOUSAKIS, MARTECH & Department of Physics, Florida State University and Department of Physics, University of Athens, Greece — The melting transition of a two-dimensional Lennard-Jones fluid is studied using classical Monte Carlo methods. Melting in two dimensions is expected to occur via a two-stage process, with separate transitions for translational and orientational order. The second moments of the translational and orientational order parameters are analyzed, and dimensionless quantities are constructed. According to finite size scaling theory, such quantities should be a function of the ratio of system size to the correlation length of the appropriate order parameter. Using the theoretical temperature dependence of the correlation length, and the fact that the correlation length approaches infinity at the critical point, the two melting transitions may be determined.

Keola Wierschem  
MARTECH & Department of Physics, Florida State University

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