

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Simulating the Melting Transition of Helium in Two Dimensions KEOLA WIERSCHEM, MARTECH & Department of Physics, Florida State University, EFSTRATIOS MANOUSAKIS, MARTECH & Department of Physics, Florida State University and Department of Physics, University of Athens, Greece — We study the melting behavior of helium in two dimensions with the path integral Monte Carlo method. Two dimensional melting theory predicts two melting transitions: solid to hexatic and hexatic to isotropic liquid, described by a loss of translational and orientational order, respectively. We calculate the translational and orientational order parameters, and use finite size scaling to determine the two melting transitions in the thermodynamic limit. We also study the superfluid/normal phase boundary of 2D helium relative to the above mentioned two stage melting boundaries.

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Date submitted: 28 Nov 2008

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