

Abstract Submitted
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Experimental Studies of the Transition to He II using Hydrogen Seed Particles MATTHEW S. PAOLETTI, GREGORY BEWLEY, DANIEL P. LATHROP, Dept. of Physics, University of Maryland at College Park, KATEPALLI SREENIVASAN, International Centre for Theoretical Physics — Experimental studies of the phase transition to superfluidity in ^4He using H_2 seed particles are presented. A gaseous mixture of hydrogen heavily diluted with helium is injected into the He I phase only a few mK above the lambda transition. The hydrogen gas solidifies into particles typically smaller than a micron, which are imaged by a CMOS camera focused on a thin laser sheet. The system is then evaporatively cooled through the lambda transition. Significant fluctuations and aggregation of the hydrogen particles are observed as the system passes through the phase transition. The fluctuating motions are characterized by particle-tracking. The aggregation is quantified by estimating the particle sizes from the intensity probability distribution function and its evolution. Systematic studies of the effects of quench rapidity and potential causes of these effects are discussed. Bewley G.P., Lathrop D.P., Sreenivasan K.R., *Nature* **441**, 588 (2006)

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