Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Flow of Helium-4 in One-dimensional Channel[1] CLAYTON R. HARRIS, SAMHITA BANAVAR, DUK Y. KIM, MOSES H.W. CHAN, Department of Physics, Pennsylvania State University, JESSE BISCHOF, JOHN V. BADDING, Department of Chemistry, Pennsylvania State University, JOHN HAYES, PIER SAZIO, Optoelectronics Research Centre, University of Southampton — Superfluidity breaks down in the one-dimensional limit. However, other experiments have demonstrated superfluid flow through pores on the order of nanometers. Here we report on studying liquid helium flow through a single-hole glass capillary with internal diameters ranging from 80 to 150 nm. We observed a significant flow rate increase below the lambda transition temperature. The estimated critical velocities at low temperatures are approximately 10 m/s, which belongs to the highest group of measured critical velocities.

[1]Experimental study at Penn State is supported by NSF Grants No. DMR 1103159

Duk Young Kim
Department of Physics, Pennsylvania State University, University Park

Date submitted: 15 Nov 2013 Electronic form version 1.4