

STUDY OF THE TEMPERATURE DEPENDENCE
OF THE λ -TRANSITION OF He⁴ INSIDE
A CARBON NANOTUBE

O. Tkachenko^{1,2}, S. Vilchynsky

Taras Shevchenko Kyiv National University
(64, Volodymyrska Str., Kyiv 01033, Ukraine;
e-mail: tkachenkol@ukr.net),

¹Austro-Ukrainian Institute for Science and Technology
(c/o AUI, Institute for Theoretical Physics
of Vienna University of Technology
Wiedner Hauptstrasse 8-10/136, A-1040 Wien, Austria,
e-mail: aui@quark.itp.tuwien.ac.at),

²On leave from Taras Shevchenko Kyiv National
University, Ukraine

S u m m a r y

We report the results of iterative calculations of the temperature dependence of the λ -transition and distribution for the superfluid density of He⁴ absorbed in a narrow single-wall carbon nanotube in the vicinity of the λ -transition. The calculations were made for different values of the carbon nanotube diameter and values of the inoculating interaction V_0 (the depth of a potential well). We demonstrate a decreasing of the temperature of the λ -transition and the superfluid density in He⁴ absorbed in a nanotube and find the appropriate “temperature shift”.