

Observation of electric response in He II under excitation of second sound waves

A.S. Rybalko, V.A. Tikhiy, A.S. Neoneta, and K.R. Zhekov

B.Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine

Experiments on observation and research of the electric response of superfluid helium are carried out under excitation of the waves of second sound in it. The new acoustic resonator with the dielectric case was applied in which, owing to the accommodation on a face wall of both a measuring electrode and bolometer, the registering the electric and thermal signals were spent simultaneously. By means of a resonant method, the peak-frequency characteristics of several fashions of the second sound were measured and is shown, that the signal of the electric response is $\approx 10^{-7}$ V at amplitudes of temperature oscillations in a wave $\approx 10^{-3}$ K. It is established, that in the temperature range 1.4 – 2.1 K, the ratio between amplitudes of temperature oscillations and electric voltage in a wave of the second sound, does not depend on temperature. Using a method of short circuit, internal wave resistance of a source of electric activity of superfluid helium is measured.