

About influence of the superfluid flows on interaction of SHF waves with He II

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Resonant absorption of the microwaves in form of narrow line on frequencies corresponding to energy of rotons experimentally was revealed in [1]. It also was found that, there is an influence of relative movement velocity of normal and superfluid components, which was created by the Kapitsa cannons, on the character of resonant interaction of the microwaves. With the increase in velocity of relative movement, the factor of absorption of the microwaves decreased, at the excess of some critical velocity absorption of waves was replaced by their radiation. Similar effects take place in the plasma physics at the description of linear and nonlinear Landau attenuation of plasma waves on particles, and also excitation of these waves by streams of particles, moving with the velocity higher than some critical [2].

Considering that the narrow line can be explained by forced microwave scattering from rotons the attenuation factor of microwaves is obtained taking into account relative motion of normal and superfluid components. A critical velocity is found.

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[2]A. I. Akhiezer, I. A. Akhiezer, R. V. Polovin, A. G. Sitenko, and K. N. Stepanov, *Plasma Electrodynamics*, edited by D. ter Haar, vol.I, Oxford, New York, Pergamon Press (1975)