

ON THE NATURE OF A NARROW ROTON
ABSORPTION LINE IN THE SPECTRUM
OF A DISK-SHAPED SHF RESONATOR

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S u m m a r y

We calculate the probability of the creation of a circular phonon (c-phonon) in He II by a c-photon of the resonator. It is shown that this probability has sharp maxima at frequencies, where the effective group velocity of the c-phonon is equal to zero; the density of states of c-phonons strongly grows at such frequencies. For He II, these frequencies correspond to a roton and a maxon. From the probability of the c-roton creation, we calculate the roton line width which is found to approximately agree with the experimental one. We conclude that the roton line observed in the super-high-frequency (SHF) absorption spectrum of helium is related to the creation of c-rotors. A possible interpretation of the Stark effect observed for the roton line is also proposed.