

## Porosity dependence of sound propagation in liquid-4He-filled aerogel

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### Abstract

Longitudinal sound-wave propagation has been studied in an aerogel-liquid  $^4\text{He}$  system for various porosities of aerogel. The superfluid transition was identified as the absorption peak, whose magnitude was suppressed by aerogel. The sound velocity was analyzed within a hydrodynamic theory in both normal and superfluid phases. The absorption peak due to phonon-roton interaction around 1 K was not observed even with the most porous aerogel. The low-temperature sound velocity and attenuation show that direct collisions of phonons with aerogel strands play an important role in the acoustic properties. © 2004 MAIK "Nauka/Interperiodica".

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