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SEMINAR ZAVODA ZA TEORIJSKU FIZIKU
(Zajednički seminari Zavoda za teorijsku fiziku,
Zavoda za eksperimentalnu fiziku i Zavoda za teorijsku fiziku PMF-a)

Black Hole radiation in Bose Einstein condensates

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Sažetak:

We study the phonon fluxes when the condensate velocity crosses the speed of sound, i.e., in backgrounds which are analogue to that of a black hole. Our theoretical analysis and numerical results are based on the Bogoliubov-de Gennes equation without any further approximation. The spectral properties of the fluxes and of the long distance density-density correlations are obtained, with and without an initial temperature. In realistic conditions, the condensate temperature dominates the fluxes, and thus hides the Hawking effect, but it amplifies the long distance correlations which are intrinsic to this effect. This confirms that the correlations pattern offers a neat signature of the Hawking effect. Optimal conditions to observe the pattern are discussed. Fluxes associated with white holes are also discussed. Work based on arXiv:0905.3634.

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