Poster Session #C
Gravity theories

C14

Hawking temperature and phonon emission in acoustic holes

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Acoustic holes are the hydrodynamic analogue of standard black holes. Featuring an acoustic horizon, these systems spontaneously emit phonons at the Hawking temperature. We derive the Hawking temperature of the acoustic horizon by fully exploiting the analogy between black and acoustic holes within a covariant kinetic theory approach. After deriving the phonon distribution function from the covariant kinetic equations, we reproduce the expression of the Hawking temperature by equating the entropy and energy losses of the AH and the entropy and energy gains of the spontaneously emitted phonons. Differently from previous calculations we do not need a microscopical treatment of normal modes propagation. Our approach opens a different perspective on the meaning of Hawking temperature and its connection with entropy, which may allow an easier study of non stationary horizons beyond thermodynamic equilibrium, including dissipative effects.