Abstract Submitted
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Two-point function for a BEC acoustic black hole[1] RICHARD DUDLEY, PAUL ANDERSON, Wake Forest University, ALESSANDRO FABBRI, Centro Studi e Ricerche E. Fermi, Rome; Università di Bologna; and Universidad de Valencia-CSIC — The two point function for phonons for a Bose-Einstein condensate, BEC, with effectively one spatial dimension is calculated using the formalism of quantum field theory in curved space. The BEC has a constant flow velocity and the speed of sound is modified in such a way as to create regions of subsonic and supersonic flow. Excitations of the modes occur in the transverse direction and the direction of flow. The mode equation can be written as a wave equation with a potential in a 1+1 dimensional spacetime. Excitations in the transverse direction contribute a mass-like term to this equation. An approximation is used for this term which allows the mode equation to be solved analytically which greatly simplifies the calculation.

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