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Two-point function for a BEC analogue black hole when a mass term is present[1] RICHARD A. DUDLEY, PAUL R. ANDERSON, Wake Forest University, ROBERTO BALBINOT, Universitá di Bologna and INFN sezione di Bologna, ALESSANDRO FABBRI, Centro Studi e Ricerche Enrico Fermi (Rome), Universitá di Bologna, and Universidad de Valencia-CSIC, RENAUD PARENTANI, Université Paris-Sud — The two-point function for phonons is computed using quantum field theory in curved space techniques for a Bose-Einstein condenstate that serves as an analogue black hole. This is done in the case that the BEC is moving at a constant speed in a particular direction and excitations of the mode functions occur in the transverse direction as well as the direction of motion. The calculation reduces to an effective 1+1 dimensional calculation and the transverse excitations add a mass term to the mode equation for the phonons. The mass term significantly changes the character of the low frequency modes in the region well outside of the sonic horizon. The effects of this on the two point correlation function are investigated.

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