

Abstract Submitted  
for the APR18 Meeting of  
The American Physical Society

**BEC Black Hole Analog with Massive Phonons** RICHARD DUDLEY, PAUL ANDERSON, Wake Forest Univ, ALESSADRO FABBRI, Centro Studi e Ricerche Enrico Fermi — Several features, such as peaks in correlation functions, associated with the Hawking effect have been predicted to occur in Bose Einstein condensate(BEC) black hole analogs. We investigate an effective 1+1D BEC which has a constant flow velocity and a varying speed of sound in such a way as to create an acoustic black hole. The phonons in the BEC are allowed to be excited along the direction of flow as well as the transverse direction. This transverse excitation, which has previously been largely ignored, adds a mass-like term to the mode equation for the phonons. Using a simple approximation to the mode equation we compute the two-point function for the phonons and compare to previous results. We find the expected correlation peaks and a new feature, associated with undulations.

Richard Dudley  
Wake Forest Univ

Date submitted: 12 Jan 2018

Electronic form version 1.4