



İstanbul Yüksek Enerji Fiziği Çalıştayı  
26-27 Nisan 2014 Özyeğin Üniversitesi

27 Nisan Pazar

11:30 – 12:00

*Y. Doç. Dr. Nader Ghazanfari*

*Mimar Sinan Güzel Sanatlar Üniversitesi*

***“Acoustic superradiance from a vortex in Bose - Einstein condensates”***

Unruh's efforts to make a connection between propagation of sound in non-homogenous media and propagation of light in curved space time resulted in surprising systems appropriate for studying different features of the black holes such as spontaneous radiation and stimulated emissions. Acoustic superradiance is the analogue of Penrose process as a stimulated emission which is the extraction of energy from a rotating black hole. This process occurs in curved spacetime that is the geometry of rotating black holes. Event horizon in such a spacetime exists inside a region called ergoregion, and since the rotating energy of the black hole is located in between event horizon and ergosphere the extracting of energy becomes possible. In other words, in this process, the wave solution of the field equation is scattered from ergoregion with an increase in its amplitude. Vortex geometry could be a nice analogue of a black hole in order to observe Penrose process.

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