## 10th International Conference on Gravitation and Cosmology: New Horizons and Singularities in Gravity (ICGC 2023)



Contribution ID: 217

Type: Poster

## Superradiant Scattering Of Electromagnetic Field And Scalar Field By The Ringing Black Holes

Within the framework of static-charged and rotating black hole spacetime, an extensive amount of work suggests that the bosonic fields exhibit superradiant scattering. In this work, we have investigated the scattering of scalar waves and electromagnetic (EM) waves for Schwarzschild black hole in the ring down phase (we refer to this black hole as the "ringing black hole"), which is the last phase of the black hole merging process. Using the minimal coupling prescription, we have found the superradiant enhancement for both scalar and electromagnetic waves by numerically evaluating the absorption cross-section of the ringing black hole. Moreover, treating the scattered scalar field as an axion, we further computed its observable effects on the rotation of the plane of polarization of the photon. On the other hand, we have also put forward the prospect of direct detection of the superradiant enhancement for EM wave by the ringing black hole of primordial origin. Our current findings suggest an intriguing opportunity to investigate the black hole merging phenomena through other fundamental fields.

## Email

rajesh018@iitg.ac.in

## Affiliation

Indian Institute Of Technology Guwahati

Author: Mr KARMAKAR, Rajesh (Indian Institute Of Technology, Guwahati)
Co-author: Dr MAITY, Debaprasad (Indian Institute Of Technology, Guwahati)
Presenter: Mr KARMAKAR, Rajesh (Indian Institute Of Technology, Guwahati)
Session Classification: Gravitational Waves

Track Classification: Gravitational Waves