Contribution ID: **124** Type: **Oral**

Superradiant driven evoulution of Active Galactic Nuclei

Superradiance in spinning black holes is an intriguing phenomenon through which the black hole loses its energy and angular momentum over time. In this work, we explore the transient effect of the superradiance process in active galactic nuclei (AGN). We aim to see the spin-down effect on the accretion disk using an analytic model named Shakura Sunayev. Considering this model, we show how the accretion disk characteristics such as the total flux, temperature, density, pressure, height, and optical depth evolve with time. We then obtain the evolution of the AGN spectrum with time due to superradiance.

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Session Classification: Astrophysical Relativity

Track Classification: Astrophysical Relativity