Contribution ID: **292** Type: **Invited talk in the parallel session**

Shadows of Kerr-like black holes in $4D$ Einstein–Gauss–Bonnet gravity and constraints from EHT observations

Wednesday, 7 July 2021 09:30 (25 minutes)

Recently there has been a surge of interest in regularizing a $D \to 4$ limit of, the Einstein-Gauss-Bonnet (EGB) gravity, and the resulting regularized $4D$ EGB gravity has nontrivial dynamics. The theory admits spherically symmetric black holes generalizing the Schwarzschild black holes. Furthermore, the $4D$ non-relativistic Horava-Lifshitz theory of gravity also admits the identical black hole solution. We consider the rotating black holes in regularized $4D$ EGB gravity and discuss their horizon properties and shadow cast. The effects of the GB coupling parameter on the shape and size of shadows are investigated and analyzed in recent M87*observations from the EHT.*
We also estimate the parameters associated with $4D$ *EGB gravity Kerr black holes using the shadow observables. The inferred circularity deviation* $\Delta C \leq 0.1$ *for the M87* black hole is satisfied, whereas shadow angular diameter $\theta_d = 42 \pm 3\mu as$, within 1σ region on the GB parameter. Interestingly, the shadow axial ratio obeying $1 < D_x$
$lesssim 4/3$ is in agreement with the EHT results and thus eventuates in the $4D$ EGB gravity black holes being suitable candidates for astrophysical black holes.

Primary authors: GHOSH, Sushant (Jamia millia Islamia); Dr KUMAR, Rahul ({Centre for Theoretical Physics, Jamia Millia Islamia, New Delhi 110025, India)

Presenter: GHOSH, Sushant (Jamia millia Islamia)

Session Classification: Hořava–Lifshitz Gravity

Track Classification: Alternative Theories: Horava-Lifshitz Gravity