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## A new class of traversable wormhole metrics

In this work, we have formulated a new class of traversable wormhole metrics. Initially, we have considered a wormhole metric in which the temporal component is an exponential function of r but the spatial components of the metrics are fixed. Following that, we have again constructed a generalized wormhole metric in which the spatial component is an exponential function of r, but the temporal component is fixed. Finally, we have considered the generalized wormhole metric in which both the temporal and spatial components are generalized exponential functions of r. We have also studied some of their properties including throat radius, stability, and energy conditions, examined singularity, the metric in curvature coordinates, effective refractive index, innermost stable circular orbit(ISCO) and photon sphere, Regge-Wheeler potential and their quasinormal modes, gravitational entropy, and determined the curvature tensor. The radius of the throat is found to be consistent with the properties of wormholes and does not contain any types of singularities. Most interestingly, we find that their throat radius is the same for the same spatial component and the same range of values of m. In addition to these, they also violate the Null Energy Condition(NEC) near the throat. These newly constructed metrics form a new class of traversable wormholes.

## Field of contribution

Theory

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