Contribution ID: **115** Type: **not specified**

Exploring wormhole solutions with global monopole charge in the context of $f(Q)$ gravity

Thursday 12 December 2024 16:24 (17 minutes)

This study explores the potential existence of traversable wormholes influenced by a global monopole charge within the $f(Q)$ gravity framework. To elucidate the characteristics of these wormholes, we conducted a comprehensive analysis of wormhole solutions employing three different forms of redshift function under a linear $f(Q)$ model. Wormhole shape functions were derived for barotropic, anisotropic, and isotropic Equations of State (EoS) cases. However, in the isotropic EoS case, the calculated shape function failed to satisfy the asymptotic flatness condition. Additionally, we observed that our obtained shape functions adhered to the flaring-out conditions under an asymptotic background for the remaining EoS cases. Furthermore, we examined the energy conditions at the wormhole throat with a radius r_0. We noted the influences of the global monopole's parameter η, the EoS parameter ω, and n in violating energy conditions, particularly the null energy conditions. Finally, we conducted a stability analysis utilizing the Tolman-Oppenheimer-Volkov (TOV) equation and found that our obtained wormhole solution is stable.

Presenter: TAYDE, MORESHWAR

Session Classification: Parallel Session