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Properties of relativistic advective accretion flow in a Kerr-like wormhole

We study the relativistic, inviscid, advective accretion flow in a stationary axisymmetric Kerr-like wormhole spacetime characterized by the spin parameter ($a_{\rm k}$) and the dimensionless parameter (β). While doing this, we solve the governing equations that describe the relativistic accretion flow in a Kerr-like wormhole and calculate all types of accretion solutions, including transonic as well as subsonic ones. Further, we examine how the behavior of the accretion solutions alters due to the variation of the model parameters, namely energy (E), angular momentum (λ), $a_{\rm k}$, and β. We identify the effective region of the parameter space in $\lambda - E$ plane for multiple critical points and observe the effect of $a_{\rm k}$ and β in obtaining the parameter space. Moreover, we also retrace the parameter space in $a_{\rm k} - \beta$ plane for multiple critical points in terms of energy (E) and angular momentum (λ). We calculate the disc luminosity (L) considering free-free emissions for transonic accretion solutions and examine the profile of maximum disc luminosity ($L_{\rm max}$) with $a_{\rm k}$ and β. Finally, we discuss the implication of this model formalism in the context of the astrophysical applications.

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