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VSL-Gravity in light of PSR B1913+16 Full Data Set: Upper limits on graviton mass and its theoretical consequences

Very Special Linear Gravity (VSL-Gravity) is an alternative model of linearized gravity that incorporates massive gravitons while retaining only two physical degrees of freedom thanks to gauge invariance. Recently, the gravitational period-decay dynamics of the model has been determined using effective field theory techniques. In this study, we conduct a comprehensive Bayesian analysis of the PSR B1913+16 binary pulsar dataset to test the predictions of VSL-Gravity. Our results place a 95\% confidence level upper bound on the graviton mass at m_g
$lesssim 10^{-19}\,\mathrm{eV}/c^2$. Additionally, we observe a significant discrepancy in the predicted mass of one of the binary's companion stars. Lastly, we discuss the broader implications of a non-zero graviton mass, from astrophysical consequences to potential cosmological effects.

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