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VSL-Gravity in ligth 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 two physical degrees of freedom due to gauge invariance. Recently, the model's gravitational period decay dynamics have been calculated 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 (CL) upper bound on the graviton mass, m_g, at approximately 10^{-19} eV. 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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