Abstract Submitted
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Shapiro Delay of Pulsar J1640+2224 NATASHA L. MCMANN, West Virginia University, JORIS VERBIEST, Universität Bielefeld — Pulsar J1640+2224 is a binary millisecond pulsar with a white dwarf companion and is being used in pulsar timing arrays being used in experiments to detect gravitational waves. A previous study of the system's Shapiro Delay by Löhmer et al, 2005 constrained the companion mass to m2 =0.15+0.08 -0.05 Msolar which would imply an unprecedentedly low pulsar mass. We improved their result by analyzing pulsar timing data from four different radio telescopes: the Effelsberg 100m radio telescope in Germany, the Westerbork Synthesis Radio Telescope in the Netherlands, the Nançay radio telescope in France, and the Lovell radio telescope at Jodrell Bank in the United Kingdom. Our study constrains the companion mass to m2=0.28+0.35 -0.03 Msolar and the pulsar mass to m1=1.51+3.30 -0.22 Msolar. The relatively wide orbit in which this pulsar resides (period $\sim$ 6 months) complicates this analysis as it introduces covariances with the Earth's motion. Continued monitoring should therefore allow further improvements to this mass measurement.

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