

Abstract Submitted  
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**Eccentric binary effects in dynamical Chern-Simons gravity** LEO STEIN, Cornell University, KENT YAGI, NICOLÁS YUNES, Montana State University, TAKAHIRO TANAKA, Kyoto University — One of the most promising natural laboratories for testing corrections to general relativity is an eccentric pulsar binary such as J0737-3039. The correction on which we focus is dynamical Chern-Simons (DCS) gravity, a theory containing a parity-odd scalar, motivated by fundamental physics. Because of parity violation, DCS exhibits corrections distinct from well-studied even-parity theories (Brans-Dicke). We compute the leading conservative and dissipative corrections to the orbit, most importantly the rate of pericenter advance, change in inclination, and the ascending node, and less prominent effects such as the correction to the orbital decay and the precession of the bodies' spins. Given how (non-)relativistic the presently-known systems are, we comment on the difficulty of constraining DCS with presently available data.

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