

- **Constraining theories of gravity using gravitational radiation reaction**
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A new test to constrain alternative theories of gravity based on the predictions that they make with respect to the magnitude of gravitational radiation losses is proposed. Specifically, the effects of angular momentum losses predicted by alternative theories on the evolution of a particular class of close interacting binaries known as Cataclysmic Variables (CVs) are examined. CVs are stellar binaries consisting of an ordinary star that is so close to its white dwarf companion that it overflows its Roche Lobe thereby losing matter to the companion. Over the billions of years that it takes for these binary systems to evolve, the orbital period decreases from ~ 10 hours to 80 minutes and then back to higher periods. The value of the orbital period minimum is governed almost solely by the magnitude of the angular momentum losses. Larger orbital angular momentum losses due to gravitational radiation will cause the minimum orbital period to be shifted to larger values. Unlike some tests that are rendered insensitive because the two binary components are similar in mass and composition (e.g., the famous binary pulsar PSR1913+16), the proposed test does not suffer from this limitation. The strengths and weaknesses of this new test are fully explored.