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Gravitational Memory Waveforms in Brans-Dicke Theory SHAMMI TAHURA, DAVID NICHOLS, KENT YAGI, University of Virginia — Gravitational-wave (GW) memory effects are lasting changes in the GW strain and its time integrals following bursts of GWs. They are closely related to the symmetries of asymptotically flat spacetimes and their corresponding conserved charges. There are three types of GW memory effects (displacement, spin, and center-of-mass) that are related to different conserved charges and have different observable effects. GW memory effects are well studied in general relativity (GR) but have not been explored as carefully in theories beyond GR. One of the simplest modified theories of gravity is Brans-Dicke theory, which includes a massless scalar field nonminimally coupled to gravity. This theory has a scalar breathing polarization of GWs in addition to the tensor GWs in GR, and there can be scalar GW memory effects in addition to the tensor GW memory effects. The scalar memory effects are not related to symmetries or conserved quantities, but the scalar waves (and their memory) do affect the tensor memories. I will present the leading Newtonian corrections to the tensor displacement and spin GW memory effects from nonspinning, quasi-circular compact binaries in Brans-Dicke theory.

Shammi Tahura
University of Virginia

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