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Spin Precession in Dynamical Chern-Simons Gravity: A Complete Picture NICHOLAS LOUTREL, NICOLAS YUNES, Montana State University, TAKAHIRO TANAKA, Kyoto University — Gravitational interactions between black holes in a binary system induce precession of the black holes spin angular momenta and the orbital angular momentum. This effect is imprinted in an amplitude modulation of the observed gravitational wave signal from the binary, which may allow us to probe the fundamental nature of the gravitational interaction and constrain modified theories of gravity that have evaded current observations. One such theory, dynamical Chern-Simons gravity, modifies spinning black holes through the presence of additional scalar degrees of freedom. In this talk, I will present the modified spin precession equations in this theory, calculated using effective field theory and the post-Newtonian formalism. I will further comment on the existence of conserved quantities and the prospects of constructing spin precessing gravitational waveforms for use in constraining the theory.

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