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A Subtlety with the Demodulation of Waveforms from Precessing Binaries ROBERT OWEN, MICHAEL BOYLE, Cornell University, HARALD PFEIFFER, Canadian Institute for Theoretical Astrophysics — When compact objects in a binary system have generic spin directions, the orbital plane of the system precesses. This precession imparts an amplitude modulation on the spherical harmonic components of the gravitational radiation. To simplify waveform extrapolation and data analysis, several groups have recently proposed demodulation procedures that essentially amount to measuring the radiation in a coordinate frame that precesses along with the orbital plane. Unfortunately, because the space of asymptotic coordinate frames has higher dimension than the space of plane orientations, an extraneous degree of freedom arises in any such procedure. If this extra degree of freedom is fixed in a nongeometric way, the demodulated waveform can be corrupted by unphysical information, such as the choice of inertial asymptotic coordinate frame. I will discuss the geometry of the problem in some detail, and outline a physically-motivated criterion that fixes this degree of freedom, and therefore the demodulated waveform, uniquely.

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