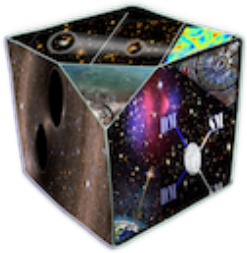

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Fourier domain gravitational waveforms for precessing eccentric binaries

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We build two families of inspiral waveforms for precessing binaries on eccentric orbits in the Fourier domain. To achieve this, we use a small eccentricity expansion of the waveform amplitudes in order to separate the periastron precession timescale from the orbital timescale, and use a SUA transformation to compute the Fourier transform in the presence of spin-induced precession. We show that the resulting waveforms can yield a median faithfulness above 0.993 when compared to an equivalent time domain waveform with an initial eccentricity of e_0 0.3. Using a circular waveform can potentially lead to significant biases in the recovery of the parameters, even when the system has fully circularized. This is an effect of the residual eccentricity present when the objects forming the binary have non-vanishing spin components in the orbital plane.

Affiliation

University of Zurich

Email address

boetzel@physik.uzh.ch

Academic position

PhD student

Primary authors: Dr KLEIN, Antoine (Institut d'Astrophysique de Paris, 75014 Paris, France); BOETZEL, Yannick (University of Zurich); Prof. JETZER, Philippe (University of Zurich); Prof. GOPAKUMAR, Achamveedu (Department of Astronomy and Astrophysics, Tata Institute of Fundamental Research, Mumbai 400005, India); Dr DE VITTORI, Lorenzo

Presenter: BOETZEL, Yannick (University of Zurich)

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