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Simulating precessing binary black hole systems SERGUEI OS-SOKINE, University of Toronto, LAWRENCE KIDDER, Cornell University, HAR-ALD PFEIFFER, CITA, MICHAEL BOYLE, Cornell University, ABDUL MROUE, CITA — Binary black hole systems are a promising source of gravitational waves for the next generation of detectors like Advanced LIGO and VIRGO. Of particular interest are systems with strong orbital plane precession, as new features in the gravitational waveform arise, for which gravitational wave data-analysis is less well understood. One of the challenges of simulating such systems using the psedo-spectral numerical relativity code SpEC (Spectral Einstein Code) is discussed, and a novel solution using quaternions is described. Results of applying this technique to fully numerical relativity simulations of strongly precessing binaries (where the orientation of the orbital plane changes by greater than 90 degrees) are presented.

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