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Use of gravitational waves to measure alignment of spins in compact binaries PHILIP GRAFF, University of Maryland - College Park, SALVATORE VITALE, RYAN LYNCH, Massachusetts Institute of Technology, RICCARDO STURANI, Universidade Estadual Paulista — Compact binary coalescences are the most promising sources of gravitational waves (GWs) for ground based detectors. Binary systems containing one or two spinning black holes are particularly interesting due to spin-orbit (and eventual spin-spin) interactions, and the opportunity of measuring spins directly through GW observations. In this work, we first consider the simple case when all simulated signals are either nearly aligned or isotropically distributed. We build a cumulative Bayesian odds ratio between the two models and we show that for both cases the right model is preferred already after a few detections; it is decisively preferred after less than a year of observation at the realistic detection rate. We also consider the scenario of a mixed population, where a fraction of signals are nearly aligned in spin and the rest are isotropic. We find that the posterior distribution for the mixture fraction is biased to larger fractions of aligned spins.

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