

Abstract Submitted  
for the APR21 Meeting of  
The American Physical Society

**Prospects for measuring off-axis spins of binary black hole sources with A+<sup>1</sup>** ALAN KNEE, JESS MCIVER, MIRIAM CABERO MUELLER, University of British Columbia — The mass and spin properties of black hole binaries inferred from their gravitational-wave signatures reveal important clues about how these binaries form. For instance, stellar-mass black holes that evolved together from the same binary star will have spins that are preferentially aligned with their orbital angular momentum. Alternatively, if the black holes formed separately from each other and later became gravitationally bound, then there is no such preference for having aligned spins. Furthermore, it is known that the presence of misaligned spins induces a general relativistic precession of the orbital plane, imprinting unique structure onto the gravitational-wave signal. The fidelity with which gravitational-wave detectors can measure off-axis spins, or equivalently, precession, will therefore have important implications for the use of gravitational waves to study binary black hole formation channels. I will summarize a new study that examines how well the A+ detector network will measure off-axis spin components, and report preliminary results comparing spin resolution between the fourth and fifth LIGO-Virgo observing runs using simulated detector noise and multiple sets of simulated signals distributed over the mass-spin parameter space.

<sup>1</sup>The authors are grateful for computational resources provided by the LIGO Laboratory and supported by National Science Foundation grants PHY-0757058 and PHY-0823459. This research is funded by an NSERC Discovery Grant.

Alan Knee  
University of British Columbia

Date submitted: 07 Jan 2021

Electronic form version 1.4