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Accuracy Of Binary Black Hole Waveform Models For Advanced LIGO PRAYUSH KUMAR, HEATHER FONG, CITA, Univ of Toronto, KEVIN BARKETT, California Institute of Technology, SWETHA BHAGWAT, Syracuse University, NOUSHA AFSHARI, California State University, Fullerton, TONY CHU, Princeton University, DUNCAN BROWN, Syracuse University, GEOFFREY LOVELACE, California State University, Fullerton, HARALD PFEIFFER, CITA, Univ of Toronto, MARK SCHEEL, BELA SZILAGYI, California Institute of Technology, SIMULATING EXTREME SPACETIMES (SXS) TEAM — Coalescing binaries of compact objects, such as black holes and neutron stars, are the primary targets for gravitational-wave (GW) detection with Advanced LIGO. Accurate modeling of the emitted GWs is required to extract information about the binary source. The most accurate solution to the general relativistic two-body problem is available in numerical relativity (NR), which is however limited in application due to computational cost. Current searches use semi-analytic models that are based in post-Newtonian (PN) theory and calibrated to NR. In this talk, I will present comparisons between contemporary models and high-accuracy numerical simulations performed using the Spectral Einstein Code (SpEC), focusing at the questions: (i) How well do models capture binary's late-inspiral where they lack a-priori accurate information from PN or NR, and (ii) How accurately do they model binaries with parameters outside their range of calibration. These results guide the choice of templates for future GW searches, and motivate future modeling efforts.

Prayush Kumar
CITA, Univ of Toronto

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