



Contribution ID: 124

Type: **Contributory Talk**

A template-based search for exotic gravitational wave signals from astrophysical compact binaries

Thursday 26 January 2023 17:30 (20 minutes)

Matched filtering technique is used to search for gravitational waves in the data obtained from terrestrial detectors like Advanced LIGO and Virgo. The data is filtered through a template bank constructed over a deemed parameter space to detect the signal. The current search framework uses template waveforms assuming General Relativity (GR) as the correct description of gravity in a highly dynamical regime. If an astrophysical gravitational wave signal carries a significant departure from GR, current template based search would fail to detect such a signal. On the other hand, modeling compact binaries in an alternative theory of gravity is a challenging task and currently no accurate waveform models are known for any alternative theories (except a few numerical simulations), therefore, possible departure from GR waveforms are accommodated by introducing fractional deviations in various coefficients of the Post-Newtonian (PN) expansion of gravitational wave phasing. We accommodate the deviation terms in geometric template placement to search for exotic signals that may carry departures from GR predicted waveforms. In this work, we consider 1σ uncertainty of the deviation parameters measured from GW170817 and target the exotic signals from BNS (binary neutron star) like events.

Primary authors: Mr SHARMA, Abhishek (Indian Institute of Technology Gandhinagar); Prof. SENGUPTA, Anand S. (Indian Institute of Technology Gandhinagar); Dr ROY, Soumen (Nikhef, Science Park 105, 1098 XG Amsterdam, The Netherlands)

Presenter: Mr SHARMA, Abhishek (Indian Institute of Technology Gandhinagar)