Contribution ID : **59** Type : **Invited Talk**

Detection Capability of Multi-band Detectors for Extra Polarizations of Gravitational Waves

Thursday, 21 May 2026 10:00 (40)

This report explores the detection capabilities of multi-band gravitational wave detectors for extra polarizations beyond general relativity. In the mHz–kHz band, the extended parameterized post-Einsteinian (ppE) framework is applied to space-based (e.g., LISA, Taiji, TianQin) and ground-based (e.g., LIGO, Virgo, KAGRA, ET) detectors, showing that multi-band observations effectively break degeneracies and improve constraints on vector and scalar polarizations. In the GHz band, high-frequency gravitational waves (HFGWs) from early universe sources (e.g., primordial black holes, brane worlds) are analyzed via the three-dimensional synchronous rotating (3DSR) system, which enables separation of all six polarization states using a photon–photon flux (PPF) method. Experimental prospects and sensitivity estimates are also discussed. The results highlight that future multi-band GW missions significantly enhance tests of gravity and probe high-frequency cosmological signals.

Presenter(s) : Prof. LI, Jin (Chongqing University)

Session Classification : Day 2