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# Novel high-frequency gravitational waves detection with split cavity

Gravitational waves can generate electromagnetic effects inside a strong electric or magnetic field within the Standard Model and general relativity. Here we propose using a quarterly split cavity and LC-resonance circuit to detect a high-frequency gravitational wave from 0.1 MHz to GHz. We perform a full 3D simulation of the cavity's signal for sensitivity estimate. Our sensitivity depends on the coherence time scale of the high-frequency gravitational wave sources and the volume size of the split cavity. We discuss the resonant measurement schemes for narrow-band gravitational wave sources and also a non-resonance scheme for broadband signals. For a meter-sized split cavity under a 14 Tesla magnetic field, the LC resonance enhanced sensitivity to the gravitational wave strain is expected to reach h ~ 10−20 around 10 MHz.

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