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Graviton-photon conversion in atomic electric fields and high frequency gravitational wave detections

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We study graviton-photon conversion in potential ground-based experiments. From graviton to photon transition, we calculate the cross section of graviton-atom interaction in the presence of spherical atomic electric fields; the obtained results hold for graviton energy around 100 keV to 1 GeV, and would be enhanced along the coherent length in extremely high frequencies; thus it gives a chance to catch MeV level gravitons from the universe with current neutrino facilities. From photon to graviton transition, we propose an experiment using entangled photon pairs to count missing photons passing through transverse magnetic tunnel, which could be used to verify the energy quantization of gravitational field.

Paper info

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