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Probing GHz gravitational waves with magnons

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In the era of gravitational wave astronomy/cosmology, it is important not only to improve the sensitivity of existing detectors but also to extend detectable frequency range with novel methods. We show that gravitational waves can induce resonant spin precessions of electrons (magnon) in the presence of an external magnetic field. This phenomenon, we call it graviton-magnon resonance, enables us to probe gravitational waves in the GHz frequency range. Furthermore, we give upper limits on GHz gravitational waves by utilizing measurements of resonance fluorescence of magnons.

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