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Stimulated emission or absorption of gravitons by light

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We study the exchange of energy between gravitational and electromagnetic waves in a Sagnac type geometry, in analogy to an “optical Weber bar.” In the presence of a gravitational wave (such as the ones measured by LIGO), we find that it should be possible to observe signatures of stimulated emission or absorption of gravitons with present day technology. Apart from marking the transition from passively observing to actively manipulating such a natural phenomenon, this could also be used as a complementary detection scheme. Non-classical photon states may improve the sensitivity and might even allow us to test certain quantum aspects of the gravitational field.

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