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Tadpole contribution to magnetic photon-graviton conversion

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Photon-graviton conversion in a magnetic field is a process that is usually studied at tree level, but the one-loop corrections due to scalars and spinors have also been calculated. Differently from the tree-level process, at one-loop one finds the amplitude to depend on the photon polarization, leading to dichroism. However, previous calculations overlooked a tadpole contribution of the type that was considered to be vanishing in QED for decades but erroneously so as shown by Gies and Karbstein in 2016. Here we compute this missing contribution in closed form and study its numerical relevance compared to the standard one.

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