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Detecting high frequency gravitational waves at ALPS

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Birefringence effects associated with the evolution of the polarization of light have been proposed as a way to detect axion DM. We exploit this method for gravitational wave detection, pointing out how we can describe axions and GW with a unified treatment. We show that by exploiting this method, the optical cavities used by the ALPSII experiment can probe in the near future GWs with frequencies above 100MHz and strain sensitivities of the order of $10^{-14}\sqrt{\text{Hz}}$. Such sensitivity allows the exploration of currently unconstrained parameter space, complementing other high-frequency GW experiments.

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