

Abstract Submitted
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Experiment to measure vacuum birefringence: Conceptual design,¹ GUIDO MUELLER, DAVID TANNER, University of Florida, BABETTE DOEBRICH, CERN, JAN POELD, AXEL LINDNER, DESY, Hamburg, BENNO WILLKE, Albert Einstein Institute for Gravitation, Hannover — Vacuum birefringence is another lingering challenge which will soon become accessible to experimental verification. The effect was first calculated by Euler and Heisenberg in 1936 and is these days described as a one-loop correction to the differential index of refraction between light which is polarized parallel and perpendicular to an external magnetic field. Our plan is to realize (and slightly modify) an idea which was originally published by Hall, Ye, and Ma [1] using advanced LIGO and LISA technology and the infrastructure of the ALPS light-shining-through-walls experiment following the ALPS IIc science run. [1] John L. Hall, Jun Ye, Long-Sheng Ma, Measurement of mirror birefringence at the sub-ppm level: Proposed application to a test of QED, PRA, Vol. 62, 013815 (2000)

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