

Quantum Vacuum Magnetic Birefringence

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The measurement of quantum vacuum magnetic birefringence is one of the ultimate experimental tests of Quantum electrodynamics. After a brief introduction to the theoretical aspects, I will present the status of the BMV (Birefringence Magnétique du Vide) experiment which is set up at the Toulouse High Magnetic Field Laboratory.

Such novel attempt to search for the effect of magnetic fields on the propagation of photons in vacuum is based on very intense pulsed magnetic fields and a very sharp optical Fabry-Perot cavity to increase the optical path in the magnetic field region. Our last results show a sensitivity better than $10^{-19} \text{ T}^{-2} / \sqrt{\text{Hz}}$, which is the best ever achieved as far as magnetic birefringence is concerned.

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