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Test of Lorentz invariance with spin-polarized ultracold neutrons

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The concept of symmetry plays a central role in our current understanding of physics at its most fundamental level.

The invariance of physical laws under rotation symmetry is perhaps the most basic example, and for such it is worthwhile to test its validity with high accuracy.

Deviation from rotation symmetry would reveal features of the new physics at very high energy scale, such as the Planck scale.

High precision measurements can be performed on ultracold neutrons spins using UCN spectrometers, normally dedicated to the search for the Electric Dipole Moment.

We present experimental null results concerning the search for a cosmic axial field acting on neutron spin, as well as the search for a Pockels-like effect of the vacuum.

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