

Limit on Lorentz and CPT Violation of the Bound Neutron Using a Free Precession $^3\text{He}/^{129}\text{Xe}$ Co-magnetometer

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We report on the search for Lorentz violating sidereal variations of the frequency difference of co-located spin-species while the Earth and hence the laboratory reference frame rotates with respect to a relic background field. The co-magnetometer used is based on the detection of freely precessing nuclear spins from polarized ^3He and ^{129}Xe gas samples using SQUIDs as low-noise magnetic flux detectors. As result we can determine the limit for the equatorial component of the background field interacting with the spin of the bound neutron to be $b_n < 1 \cdot 10^{-33}$ GeV (95% C.L.). This new result sets the tightest constrain on SME parameters for the bound neutron.

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