

## Search for axion like pseudo scalar spin interaction with a $^3\text{He}$ - $^{129}\text{Xe}$ clock comparison experiment.

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We search for a spin-dependent P- and T-violating nucleon-nucleon interaction mediated by light pseudoscalar bosons such as axions or axion-like particles. While axions are originally invented to solve the strong CP-problem, nowadays interest in axions is boosted by the fact, the axion is a candidate for dark matter. We performed an ultra-sensitive clock comparison experiment based on the detection of free precession of co-located  $^3\text{He}$  and  $^{129}\text{Xe}$  nuclear spins using SQUIDs as low-noise magnetic flux detectors. The precession frequency shift in the presence of an unpolarized mass was measured to determine the coupling of pseudoscalar particles to the spin of the bound neutron. For boson masses between  $2\ \mu\text{eV}$  and  $500\ \mu\text{eV}$  (force ranges between  $3 \times 10^{-4}\ \text{m}$  to  $10^{-1}\ \text{m}$ ) we improved the laboratory upper bounds by up to 4 orders of magnitude.

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