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## Search for spin-dependent short range interaction of the bound neutron in $^3\text{He}/^{129}\text{Xe}$ clock comparison experiments

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A very sensitive low-field magnetometer based on the detection of free spin precession of gaseous, nuclear polarized  $^3\text{He}$  or  $^{129}\text{Xe}$  samples with a SQUID as magnetic flux detector is used to search for short-range spin-dependent interactions. The magnetic field dependence (Zeeman-term) can be eliminated using co-located  $^3\text{He}/^{129}\text{Xe}$  spin samples and measuring the weighted difference of their respective spin precession frequencies, i.e.  $\Delta f = f_{\text{He}} - \gamma_{\text{He}} / \gamma_{\text{Xe}} f_{\text{Xe}}$ . Thus, one gets sensitive to purely non-magnetic interactions. We looked for a change in  $\Delta f$  when heavy masses positioned close to the cylindrical sample cell were moved away during the measurement cycle. A sensitivity of  $\sim 5$  nHz was obtained within 20 hours. Resulting limitations on spin-dependent short-range interactions will be discussed.

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