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## The search for coherent elastic neutrino-atom scattering and neutrino magnetic moment

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We discuss a new experiment based on the proposal [1] to observe for the first time the coherent elastic neutrino-atom scattering (CEvAS), using electron antineutrinos from tritium decay and a liquid He-4 target, and also to search neutrino electromagnetic properties [2,3], including the neutrino magnetic moment. The experiment is under preparation within the research program of the National Centre for Physics and Mathematics (NCPM) and the Branch of Lomonosov Moscow State University in Sarov (Russia). In CEvAS the neutrino scatters with the whole atom and the atomic electrons tend to screen the weak charge of the atomic nucleus as seen by the neutrino probe. With tritium neutrinos the interference between the He-4 nucleus and the electron cloud of the He atom produces a sharp dip in the recoil spectrum at atomic recoil energies of about 9 meV, reducing sizably the number of expected events with respect to the coherent elastic neutrino-nucleus scattering case. A low-background neutrino laboratory is being created at the NCPM with a record high-intensity tritium source of 10 MCi (1 kg) [4-6]. With the estimated sensitivity of this apparatus, it is possible to detect CEvAS for the first time and also to observe or to set an upper limit on the electron neutrino magnetic moment  $\mu_\nu$  on the level of  $\text{few} \times 10^{-13} \mu\text{B}$  at 90% C.L., that is about two orders of magnitude smaller than the current experimental limits. If necessary, at the next stage of the proposed experiment, the intensity of the tritium source can be increased up to 40 MCi (4 kg).

### References

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### In-person participation

No

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