

Abstract Submitted  
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**Revealing new processes with superfluid liquid helium detectors:  
the coherent elastic neutrino atom scattering** EMMANUELE PICCIAU,  
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STUDENIKIN, Lomonosov Moscow State University, JINR — The particle physics  
community is studying and building new technologies to detect processes never de-  
tected before. Among these, strong efforts are put into studying innovative He  
detectors based on the quantum evaporation process. The main outcome of such a  
detector is the possibility to detect light dark matter particles. However, they have  
enormous potentialities also for exploring neutrino properties. Indeed, we propose  
an experimental setup to observe coherent elastic neutrino-atom scattering (CE-  
nAS) using electron antineutrinos from tritium decay and a liquid helium target.  
In this scattering process with the whole atom, that has not been observed so far,  
the electrons tend to screen the weak charge of the nucleus as seen by the electron  
antineutrino probe. In addition to this discovery, it may be possible to measure  
fundamental weak interaction parameters at very low energy scale, never reached  
before, and set very strong limits for the presence of electromagnetic properties of  
neutrinos.

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