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Overview on the UCNtau experiment DANIEL SALVAT, Indiana University, UCNTAU COLLABORATION — The UCNτ experiment is a precision measurement of the neutron beta-decay lifetime using ultracold neutrons (UCN) in a magneto-gravitational trap. Due to its long beta-decay lifetime (880.1 $\pm$ 1.1 s, PDG2012), neutrons are also susceptible to many other loss mechanisms, such as upscatterings, absorptions on material surface, and spin flips. These interactions could act on similar time-scale as the neutron beta-decay, making precision experimental measurements very challenging. In this talk, we will describe a new effort at Los Alamos National Laboratory to measure the beta-decay lifetime using ultracold neutrons trapped in a hybrid magnetic and gravitational trap. A Halbach array is used to levitate UCN (up to 50 neV), which are confined vertically up to 0.5 m by gravity. Such a trap minimizes the chance of neutron interactions with material walls, and furthermore its open-top geometry allows implementations of novel schemes to detect neutrons and decay particles in-situ. The experiment aims to improve on the uncertainty of the neutron lifetime measurement beyond 1 second. In this talk, we will describe the design features and discuss plans to quantify systematic effects.

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