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**Measurement of the beta asymmetry in neutron decay with UCNA: status in 2017 and new opportunities**[1]

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UCNA is an experiment which measures the beta asymmetry in neutron decay, or the angular correlation between the spin of the neutron and the momentum of the emitted beta particle. When taken together with a measurement of the lifetime, the standard model provides rigorous predictions for the observables in neutron decay to about the $10^{-4}$ level. These high precision predictions set the stage for an effective probe for new physics above the energy scales reachable by the LHC. UCNA is the first experiment to measure angular correlations using ultracold neutrons (UCN). This approach is motivated by the opportunities UCN provide to control key sources of systematic error due to the neutron polarization and neutron-produced backgrounds. UCNA data was taken from 2007 to 2013, with the analysis of the 2011-2013 data completed this year. We present the status of the experiment, emphasizing the evolution of our understanding of the systematic errors. The recent upgrade of the LANSCE UCN source provides a significant opportunity to further improve the reach of UCNA in a next generation experiment, so we also outline strategies to push UCNA to precision levels complementary to the $0^+ \to 0^+$ decays, providing new constraints on BSM physics with post-LHC sensitivity.

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