Cyclotron Colloquium, Thursday, May 13th, at 1:30 pm

"Measurements of Beta-Decay in the Neutron and 19Ne: Some Recent Progress"

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We present recent measurements of the beta-decay of the neutron and 19Ne. Both systems have spin 1/2, and are characterized by isobaric analog decays involving, in leading order, two form factors. Precise characterization of these decays requires two independent measurements, one of which is typically the lifetime of the decay. For these systems, the other measurement offering the highest precision constraints has historically been the beta-asymmetry, or the angular correlation between the initial spin of the nucleon and the momentum of the emitted electron. With two independent measurements, we can extract high precision values for the fundamental parameters of the weak charged current and provide interesting constraints on extensions to the standard model. We review progress we have recently made in the study of these systems. In particular, the UCNA collaboration has completed a measurement of the beta-asymmetry of the neutron at roughly the 1% level (the first beta-decay angular correlation measurement made using ultracold neutrons). We have also recently made a measurement, in collaboration with the TRIμP collaboration at the KVI in Gronningen, of the lifetime of 19Ne with statistical uncertainty at about the 0.03% level. Details of these measurements are presented, as well as some of our plans for the next few years.