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Beta Decay Correlations Program at the Spallation Neutron Source

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Recent progress in both theory and experiment has left the unitarity of the quark mixing matrix (CKM) somewhat of an open question. The Nab experiment at the Spallation Neutron Source is designed to improve precision of the extraction of the first matrix element and shed light on experimental tensions within the neutron beta decay dataset. Nab's asymmetric spectrometer allows coincident reconstruction of the decay proton and electron energies, which are used to determine the electron-neutrino correlation coefficient. Additionally, its design lends itself to future use for a program of polarized decay correlation coefficient measurements in the same apparatus.
This talk will present preliminary results from Nab's first data collection runs, plans for the upcoming campaign and proposed measurements for the future. Finally, we will present an outlook for the program's sensitivity in tests of CKM unitarity and to new physics beyond the Standard Model.

Collaboration

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