Probing Neutron Beta Decay with the Nab Experiment

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One basic facet of the scientific process is the use of perspective- if our knowledge of a system seems exhausted from one point of view, can we learn more from another? This is beautifully illustrated by the field of neutron physics. When we are first introduced to the neutron, it is a simple neutral particle found in the nucleus of an atom. Yet when free from the nucleus, this particle undergoes a process called neutron beta decay- a fundamental example of the weak force interaction and a powerful tool in examining the Standard Model. In this talk, I will discuss an experiment that uses perspective, high precision measurements, and the physics of neutron beta decay to further probe for physics beyond the Standard Model. This experiment, the Nab experiment, aims to achieve a 10^{-3} precision measurement of the electron-antineutrino correlation parameter in neutron beta decay.