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## The BeEST Experiment: A Search for sub-MeV BSM Physics in the Neutrino Sector with Superconducting Quantum Sensors

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The search for sterile neutrinos is among the brightest possibilities in our quest for understanding the microscopic nature of dark matter in our universe. These “mostly sterile” flavors are expected to be accompanied by heavy mass states, and thus their existence can be probed via momentum conservation with SM particles in radioactive decay. One way to observe these momentum recoil effects experimentally is through high-precision measurements of electron-capture (EC) nuclear decay, where the final state only contains the neutrino and a recoiling atom. This approach is a powerful method for BSM neutrino mass searches since it relies only on the existence of a heavy neutrino admixture to the active neutrinos - a generic feature of neutrino mass mechanisms - and not on the model-dependent details of their interactions. In this talk, we describe BeEST concept, which measures the eV-scale radiation that follows the decay of  $^7\text{Be}$  ions implanted into sensitive superconducting tunnel junction (STJ) quantum sensors, and report the first results in our experimental program.

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