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Frequency Techniques in Future Neutrino Mass Measurements and Axion Searches

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Frequency-domain measurements, though common in atomic physics, remain comparatively rare in nuclear and particle physics. One longstanding exception is axion searches. Another may be beta-decay spectroscopy, including attempts to measure the neutrino mass via tritium beta decay. I will focus on the Project 8 experiment, which attempts to detect the microwave emission of a single beta-decay electron in a magnetic field. These detections enable a nondestructive, high-precision, high-rate electron energy measurement, which may make it possible to do future tritium endpoint neutrino mass measurements. I will describe ongoing Project 8 proof-of-concept work, and plans for a larger tritium experiment.