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Project 8: A New Generation of Neutrino Mass Experiment

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A direct measurement of neutrino mass still remains a challenge for today's particle and nuclear physics. The current state of the art experiment has a projected neutrino mass sensitivity down to 0.2 eV. However the lower limit suggested by the neutrino oscillation measurements is two orders of magnitude smaller. Project 8 is a new generation of direct neutrino mass measurement experiments aiming for sensitivity to the whole neutrino mass ranges allowed by the inverted mass hierarchy. The proof of concept for Cyclotron Radiation Emission Spectroscopy (CRES) as the novel technique for measuring electron energies has been illustrated through spectroscopy of ^{83m}Kr lines. We present the phased program to achieve the desired sensitivity with emphasis on the recent advances toward the first measurement of the continuous tritium spectrum.

Primary author: Mr ASHTARI ESFAHANI, Ali (University of Washington)

Presenter: Mr ASHTARI ESFAHANI, Ali (University of Washington)

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