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Towards Fierz Interference Measurements in Neutron and ${}^6\text{He}$ β Decays¹

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Precision measurements in experiments with neutron and nuclear β decays are sensitive to new physics beyond the Standard Model (SM). The signature of a possible exotic scalar or tensor contribution to the weak interaction would produce a small distortion to the β -decay energy spectrum relative to the SM prediction. To search for such a distortion, a high-precision measurement of the β -decay energy spectrum is required. Cyclotron Radiation Emission Spectroscopy (CRES) is a new electron spectroscopy technique being developed by the Project 8 experiment, which is capable of measuring the energy of β particles with high precision. This talk will explore the sensitivity potential of Fierz interference measurements in neutron and ${}^6\text{He}$ decays using CRES. We will introduce the Fierz interference term and the CRES technique before presenting a survey of potential systematic uncertainties associated with CRES and their effects on the Fierz interference term, a non-zero value of which would indicate the presence of scalar or tensor weak currents.

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