Studies of Fundamental Interactions with Trapped ^{8}Li and ^{8}B Ions

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Measurements of the beta-neutrino angular correlation coefficient ($a_{\beta\nu}$) in β decay provide information of the presence of possible exotic interactions beyond the Standard Model. The ^{8}Li-^{8}B radioactive mirror nuclei represent a particularly attractive system for these studies due to their small masses, large Q-value, and a triple-correlation that enhances the sensitivity to detect so-called "New Physics." Furthermore, it is possible to search for the existence of Standard Model-forbidden Second-Class Currents and to test the Conserved-Vector-Current hypothesis by comparing correlation measurements in ^{8}Li and ^{8}B. In this talk I will describe the experiments carried out at Argonne National Laboratory to measure with high precision $a_{\beta\nu}$ with trapped ^{8}Li and ^{8}B ions and present the latests results of our effort to test the Standard Model at low energies. I will also present future plans of our ion trapping program to test discrete symmetries like Parity and Time-reversal.