Improved tensor limits from the A=8 fundamental physics program at ANL*

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The beta-decay Paul trap has been used for a series of $\alpha - \beta - \nu$ angular correlation measurements in the beta decay of trapped ^{8}Li and ^{8}B isotopes. The ions are confined in a linear Paul trap surrounded by an array of four sets of double-sided silicon detectors. These decays follow the sequence ^{8}Li (or ^{8}B) $\rightarrow$ ^{8}Be*$+ \nu + \beta \rightarrow \alpha + \alpha + \nu + \beta$ and the trapped ion sample floating at rest in the center of the detector array provides an ideal configuration for a full reconstruction of the events. Using these systems, new limits on the contribution of an intrinsic tensor component to the electroweak interaction have been determined by measuring the energy difference spectrum of the Îą particles emitted along the direction of the Î¸ particle. In addition, combining the results from both mirror decays allow to set more general limits using the fact that certain corrections change sign in these decays. These results have been recently published in 3 PRLs [1,2,3]. In addition, a new large data set has been obtained with an improved ion trap design that reduces beta scattering contributions by a factor of 4 and should lead to a further improvement on the tensor limits and a direct experimental determination of some of the leading theoretical corrections.

[1] M.T. Burkey *et al.*, PRL **128** (2022) 202502.
[2] G.H. Sargsyan *et al.*, PRL **128** (2022) 202503.
[3] A.T. Gallant *et al.*, PRL **130** (2023) 192502.

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