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Monte Carlo simulations to obtain the weak magnetism term for ^{22}Na beta decay

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Abstract content
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The study of ^{22}Na beta decay offers an opportunity to test the Standard Model via measurements of the β - γ angular correlation. A previous measurement of this correlation yielded a non-zero value, indicating the need for a higher-order correlation to the decay, beyond the allowed V-A approximation. On assuming the Conserved Vector Current (CVC) hypothesis for weak interactions and using the magnetic dipole M1 width of the analog 2^{-1} state in ^{22}Na , one obtains an unexpectedly large “second-class” form factor that is in disagreement with the Standard Model prediction

This talk describes an analysis of data obtained from a prior $^{21}\text{Ne}(p,\gamma)$ experiment to obtain the M1 width of the 2^{-1} state of interest in ^{22}Na . We aim to use the M1 width and an independent measurement of the β - γ angular correlation to obtain a higher order Standard-Model-allowed weak magnetism term, in an attempt to explain the observed discrepancy mentioned above. I will also describe some Monte Carlo simulations performed to extract E2/M1 mixing ratio from these data.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

Main supervisor (name and email) and his / her institution

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No

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Yes

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