

Recent Status of Weak-Interaction Tests via Precision Superaligned Beta-Decay Measurements at TRIUMF

Wednesday, 30 May 2018 17:50 (20 minutes)

Tests of the Standard Model through precision measurements of nuclear decay properties have proven to be a valuable tool in experimental subatomic physics. Of these investigations, $0^+ \rightarrow 0^+$ β -decay data are among the most important, as they currently provide the most precise determinations of both the vector coupling strength in the weak interaction, G_V , and the up-down element of the CKM quark mixing matrix, V_{ud} . These studies also provide some of the best constraints on the possibility of additional quark generations, as well as limits on exotic currents in the weak interaction. The three quantities that are required for performing these tests (branching ratio, half-life, and Q-value) can all be measured to high-precision with rare-isotope beams at the TRIUMF-ISAC facility in Vancouver, Canada. In this talk, I will highlight recent experimental work with both the GRIFFIN spectrometer and the TITAN ion-trap system, as well as theoretical advances towards first-principle nuclear-structure corrections. Finally I will provide a picture of where the remaining critical measurements still reside, and where work at TRIUMF is headed in the near future.

E-mail

kleach@mines.edu

Collaboration name

GRIFFIN and TITAN Collaborations

Funding source

This work is supported by the US DOE under grant No. DE-SC0017649 and NSERC (Canada). TRIUMF receives funding via the NRC (Canada).

Primary author: Prof. LEACH, Kyle (Colorado School of Mines)

Presenter: Prof. LEACH, Kyle (Colorado School of Mines)

Session Classification: Tests of Symmetries and the Electroweak Interaction

Track Classification: TSEI