

Abstract Submitted  
for the DNP11 Meeting of  
The American Physical Society

**High-precision digital  $\beta$  counting for superallowed  $\beta$ -decay studies** LIXIN CHEN, JOHN C. HARDY, Cyclotron Institute, Texas A&M University, College Station, TX 77843, USA — Superallowed  $\beta$ -decay  $f_t$  values must be measured to high precision in order to test the Electroweak Standard Model and probe new physics beyond it. To establish a more robust  $\beta$  counting system for high precision half-life measurements, we have developed a new digital  $\beta$  counting system, which we have now tested on-line. An 8-bit digitizer with 1 GS/s sampling rate was used to record the waveforms from our gas proportional counter, and a software filter applied to discriminate and count genuine decay events. The software filter uses pulse-shape analysis to separate genuine  $\beta$ -decay events from proportional-counter spurious pulses. The digital counting method and the results obtained from our recent on-line test experiments will be presented in detail. This work demonstrates the first successful application of a high-speed digitizer and off-line digital-signal-processing techniques to high precision nuclear  $\beta$ -decay lifetime measurements.

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Date submitted: 27 Jun 2011

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