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Precise Half Life Measurement of ^{26}Si V.E. IACOB, V. GOLOVKO, J. GOODWIN, J.C. HARDY, N. NICA, H.I. PARK, L. TRACHE, R.E. TRIBBLE, Cyclotron Institute at Texas A&M University — As part of our program to test the unitarity of the Cabibbo-Kobayashi-Maskawa (CKM) matrix *via* $0^+ \rightarrow 0^+$superallowed β transitions, we recently measured the half-life of ^{26}Si. The radioactive ^{26}Si beam was obtained with a ^{27}Al primary beam at $30A$ MeV, which bombarded a cryogenic hydrogen target held at a pressure of 2.0 atm. From the reaction products, a high-purity ^{26}Si beam at $25A$ MeV was selected with the MARS spectrograph. The beam was then extracted in air, passed through a 0.3-mm-thick BC-404 plastic scintillator and a set of Al degraders, which had been adjusted so that the radioactive nuclei stopped in the center of the 76-μm-thick aluminized-mylar tape of our fast tape-transport system. We collected ^{26}Si nuclei for 1.3 s; then the beam was switched off and the activity was moved in less than 0.2 s to the center of a 4π proportional counter, located in a well-shielded region. The observed decays were then multi-scaled over a 44 s time span. To ensure an unbiased result, we split the experiment into many runs, each differing from the others in its discriminator threshold, detector bias or dominant dead-time setting. The analysis of these separate runs showed no systematic bias with these parameters. Our preliminary result agrees with the currently accepted (average) value, and the full analysis is expected to yield an uncertainty of 0.05% or better.

V.E. Iacob
Cyclotron Institute at Texas A&M University

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