Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Current status of superallowed $0^+ \rightarrow 0^+$ nuclear β decay and the value of V_{ud} J.C. HARDY, I.S. TOWNER, M. BENCOMO, V.E. IACOB, H.I. PARK, L. CHEN, T. ERONEN, V. HORVAT, N. NICA, Cyclotron Institute, Texas AM University — Currently, the results from superallowed $0^+ \rightarrow 0^+$ nuclear β decays provide the most precise value for V_{ud}, the up-down element of the Cabibbo-Kobayashi-Maskawa (CKM) quark-mixing matrix. According to the most recent critical survey of world data [1], the ft values for 14 of these superallowed transitions have been established to a precision of order 0.1% or better. These results, which cover a wide range of parent nuclei from ^{10}C to ^{74}Rb, constitute a very robust data set. After radiative and isospin-symmetry-breaking corrections have been applied, the resulting corrected $\mathcal{F}t$ values are all consistent with one another, demonstrating agreement with conservation of the vector current (CVC). With CVC upheld, the $\mathcal{F}t$-value results can then be averaged to obtain a value for G_V, the vector coupling constant, and for V_{ud}. Since the last survey closed, new measurements have appeared, which do not significantly change the conclusions in [1] but do reflect constructively on isospin symmetry breaking and on possible scalar currents. Up-to-date outcomes will be presented.
[1] J.C. Hardy and I.S. Towner, Phys. Rev. C 91, 025501 (2015).

John C. Hardy
Cyclotron Institute, Texas A
M University

Date submitted: 29 Jun 2016 Electronic form version 1.4