



DoNuTS Technical Meeting

Time: 1600 Wednesday, 21 January 2009

Place: NE Conference Room, 1106 Etcheverry (note room change)

Speaker: Eric Norman, UCB Nuclear Engineering

Subject: Evidence Against Correlations Between Nuclear Decay Rates and the Earth-Sun Distance

Several careful experiments designed to study the decays of long-lived radioactive isotopes have reported observations of small periodic annual variations modulating the well-known exponential decay curve. Recently, Jenkins *et al.* proposed that these decay rate variations were correlated with the distance between the Earth and the Sun. Jenkins *et al.* went on to suggest that the underlying mechanism responsible for this correlation might be some previously unobserved field emitted by the Sun or perhaps was the result of the annual variation in the flux of solar neutrinos reaching the Earth. If the Jenkins *et al.* proposal were correct, it would have profound consequences for many areas of science and engineering. Thus, it is important to test this proposal in a variety of experiments. Therefore, we have reexamined our previously published data to search for evidence of correlations between the rates for the alpha, beta-minus, beta-plus, and electron-capture decays of ^{22}Na , ^{44}Ti , $^{108}\text{Ag}^m$, $^{121}\text{Sn}^m$, ^{133}Ba , and ^{241}Am and the Earth-Sun distance. We find no evidence for such correlations and set limits on the possible amplitudes of such correlations substantially smaller than those observed in previous experiments.