

Abstract Submitted  
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**Measurement of the Beta Neutrino Correlation in Laser-Trapped  $^{21}\text{Na}$** <sup>1</sup> PAUL VETTER, JAMIL ABO-SHAEER, REINA MARUYAMA, STUART FREEDMAN, Lawrence Berkeley National Laboratory — We have measured the beta neutrino correlation in the decay of radioactive  $^{21}\text{Na}$  atoms confined in a magneto-optic trap using a technique which detects the low-energy electrons shaken off by the daughter recoil atom ( $^{21}\text{Ne}$ ). Using a time-of-flight momentum analysis technique, we measure the energy spectrum of the ionized recoil nuclei in coincidence with the shake-off electrons to determine the beta-neutrino correlation. A major source of systematic error in this type of experiment arises from photoassociative binding of the trapped atoms into cold, trapped dimer molecules, despite the small number of trapped atoms. When an atom bound in a molecule beta decays, the momentum of the recoil nucleus is strongly perturbed by scattering from its molecular partner. We have studied the formation rate of cold dimer molecules in our trap, and have implemented a dark trap. This trap suppresses the fraction of atoms which populate the atomic excited state (necessary for photoassociation) and suppresses the molecule formation rate by roughly three orders of magnitude. Current results will be presented.

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