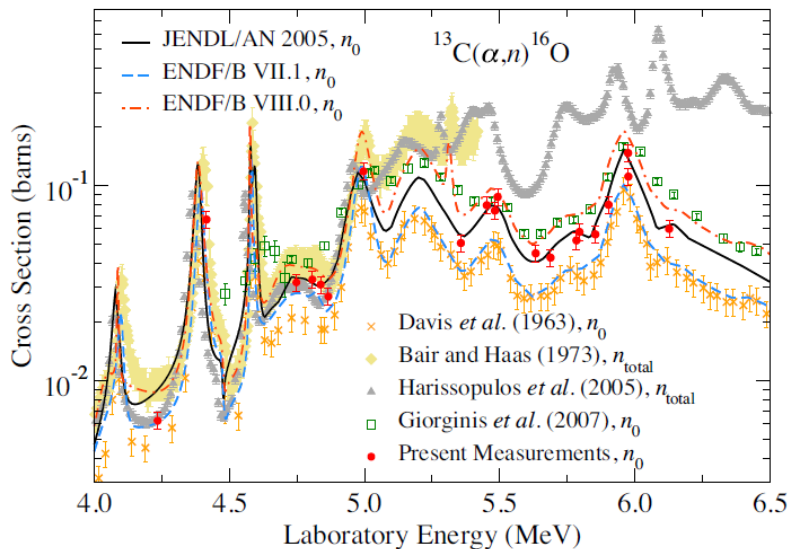
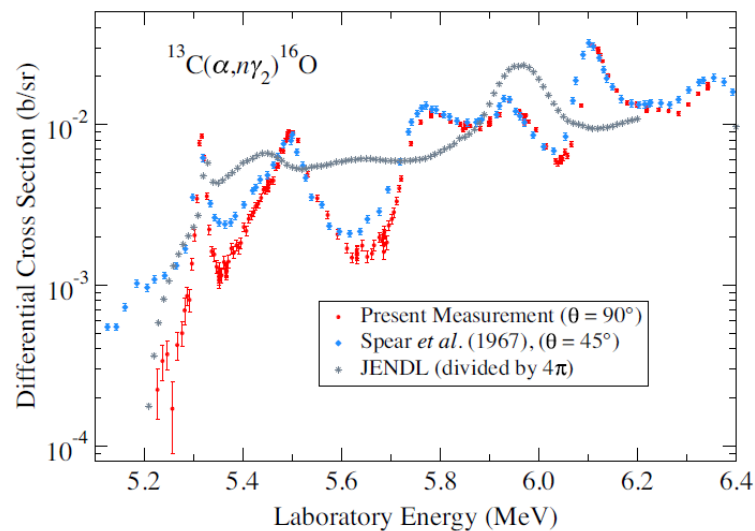


# New $^{13}\text{C}(\alpha,n)^{16}\text{O}$ Cross Section with implications for Neutrino Mixing



Precise antineutrino measurements that constrain the neutrino mixing angles and geoneutrino spectra are all very sensitive to background induced by the  $^{13}\text{C}(\alpha,n)^{16}\text{O}$  reaction. A new measurement of this reaction cross section, performed at the University of Notre Dame, improves the estimate of this significant background for large anti-neutrino detectors.



Our setup, particularly sensitive to neutrons at the energy of interest, used deuterated liquid scintillators and spectrum unfolding, to separate the ground state cross section, while making measurements of the excited state transitions via secondary  $\gamma$ -ray detection. Our measurements imply significant adjustments to the background estimates used in the KamLAND analysis.



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