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A Solution to LSND's Second Puzzle

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We present a calculation of the $^{12}\text{C}(\nu_\mu, \mu^-)^{12}\text{N}^*$ flux-averaged, inclusive cross section from the Liquid Scintillator Neutrino Detector. The calculation is based upon a relativistic Fermi gas model that has been corrected for long range correlation and binding energy effects. The long range correlation effects are introduced via a non-local, momentum dependent potential in the kinematics of the lepton-nucleon vertex. The potential parameters, most importantly the effective mass $M^* = M_{nucleon}/1.4$, have been tuned to match electron scattering data in the appropriate energy range. The binding energy appropriate for ^{12}N , 27 MeV, is used in stead of the traditional 25 MeV found from the electron data. The result agrees well with the LSND measurement of $10.5 \times 10^{-40} \text{cm}^2$. The calculation makes up for its lack of theoretical rigor in its intuitive simplicity and reliance on well established electron scattering measurements.