Evaluation of Associated Laguerre Polynomials in Neutrino Induced Pair Creation[1] KATHERINE COUGHRAN, TODD TINSLEY, Hendrix College — Spherically symmetrical models for type II supernovae are attractive due to their relative simplicity, but most fail to produce an actual explosion of the star. One reason may be the inherent anisotropy of the star, but another may be missing sources of energy. A possible energy source could come from the decay of a neutrino into an electron-positron pair while subject to the very large magnetic fields in supernovae. Calculations of the rate of pair production at these large magnetic fields require that we consider electrons and positrons in highly excited energy states, called Landau Levels. At large Landau levels, however, direct computation becomes challenging and prone to error. In this poster I will present how errors arise in direct computation and how I implemented a fourth-order Runge-Kutta scheme that was successful in limiting error without significant increases in computational time.

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