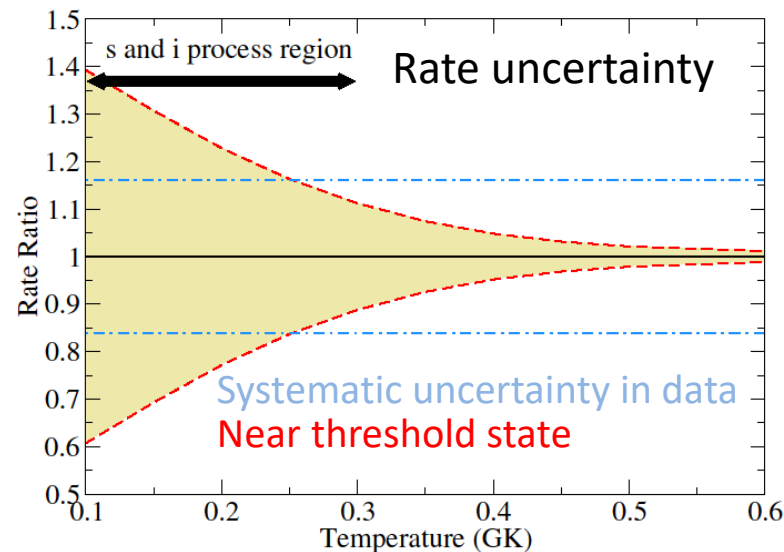
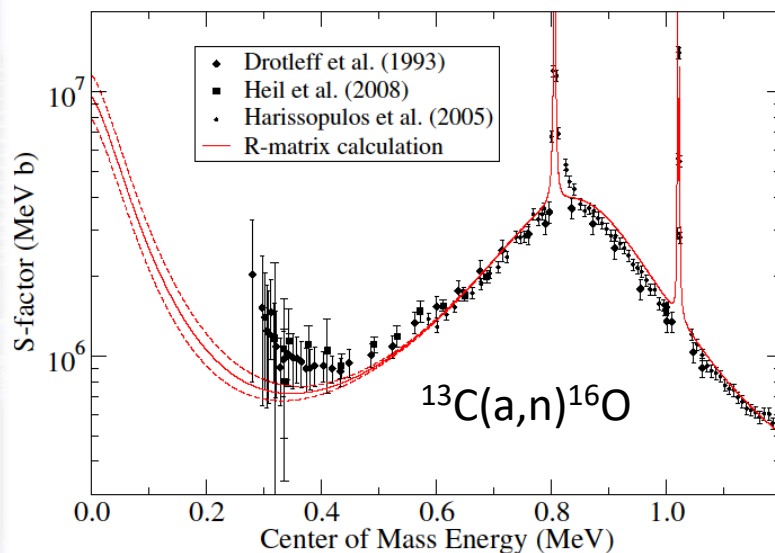


# The near threshold resonance in the $^{13}\text{C}(\alpha,n)^{16}\text{O}$ reaction



The  $^{13}\text{C}(\alpha,n)^{16}\text{O}$  reaction is the main source of neutrons for the s and i processes in asymptotic giant branch stars and carbon enhanced metal poor stars respectively. The reaction rate over the relevant temperature range from 0.1 to 0.3 GK translates into a center-of-mass energy range of 150 to 540 keV. Current measurements extend down to 300 keV, still requiring an extrapolation to extract the cross section.



The uncertainties associated with the low energy S-factor extrapolation are investigated using R-matrix to test the sensitivity of the cross section to the energy, width, and Coulomb re-normalized asymptotic normalization coefficient of the near threshold resonance. At these low energies, the high energy tail of a  $1/2^+$  state near the reaction threshold makes a significant contribution to the cross section, but its amplitude is still highly uncertain.

