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# Degeneracy corrections for stellar neutron capture rates and their implications for the R-process

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Heavy element synthesis within stellar bodies typically manifests in explosive environments such as neutron star mergers. These potential sites present high enough neutron densities that facilitate neutron degeneracy. In this work, we study the effect of neutron degeneracy on stellar capture rates for nuclei ranging from stability to the neutron drip line. We investigate how degeneracy can alter traditional reaction rates over a range of thermodynamic conditions that are typical of the r - process. Our results show that degeneracy can change the capture of neutrons by orders of magnitude compared to captures under strictly explosive conditions. Furthermore, we demonstrate how thermally populated targets can further enhance the capture of degenerate neutrons. Our corrections to stellar neutron capture rates may lead to changes in the abundance evolution of r-process elements.

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