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Late Time Decays and the r-Process Abundance Pattern[1] REBEKA KELMAR, Union College — The r-process is the rapid capture of neutrons creating unstable neutron rich nuclei. This process is very quick, lasting only a couple of seconds. Afterwards those nuclei decay to stability over much longer timescales. We wrote a computer program to model the ways that nuclei created by the r-process decay back to stability using theoretical and experimental values for the probabilities that a given nuclei would beta decay, beta delayed neutron emit, alpha decay, and beta delayed fission. We then compared the resulting elemental abundances to abundance patterns from metal poor halo stars. We also examined the ratios of thorium 232 to uranium 238 and uranium 235 to uranium 238. We found the thorium to uranium ratio to be particularly sensitive to how late-time fission is included.

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