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Neutron Capture Rates in R-Process Nucleosynthesis at Hot Outflows From Black Hole – Neutron Star Merge ANA PAOLA MIKLER, REBECCA SURMAN, Union College — Simulations of r-process, or rapid neutron capture, nucleosynthesis require nuclear data such as masses, beta decay rates, and neutron capture rates for thousands of nuclei far from stability. While the influence of nuclear masses and beta decay rates on the r process has been well studied, neutron capture rates have received less attention. Furthermore most of the existing studies on the influence of neutron capture rates on the r process focus on a particular astrophysical site: the core-collapse supernova. Here we examine the effects of individual neutron capture rates on an r process in an alternate environment – hot outflows from black hole-neutron star mergers. We focus on nuclei in the $A \sim 130$ r-process abundance peak and consider outflow trajectories that produce either a weak r process or a main r process. We identify the nuclei whose capture rates affect the largest changes to the resulting abundance pattern and describe the mechanisms by which such changes occur.

Ana Paola Mikler
Union College

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