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Core-Collapse Supernova Nucleosynthesis of Promptly Ejected Material CODY MELTON, CARLA FROHLICH, North Carolina State University — Understanding nucleosynthesis of the heavy elements in core-collapse supernovae is an important step in determining the origin of the heavy elements in the universe. Simulations of core-collapse supernovae produce proton-rich as well as slightly neutron-rich ejecta. The electron fraction, which determines the initial abundances in the explosion, is highly sensitive to the details of the simulations. Here we investigate both proton and neutron-rich ejecta. In the neutron-rich ejecta, we find a new nucleosynthesis pathway consisting of neutron captures and subsequent proton captures between 4 and 3 GK. Proton-rich ejecta produces a weak neutrino-proton process, as seen previously.

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