Role of Nucleon Strangeness in Core-Collapse Supernova Explosions ¹ TIMOTHY HOBB, University of Washington, MARY ALBERG, Seattle University, GERALD MILLER, University of Washington — The ongoing quest to simulate explosions of core-collapse supernovae (CCSNe) in hydrodynamical calculations has placed an enormous premium upon the nuclear and hadronic processes integral to the system’s evolution (i.e., the microphysics). In this context, modifications to the neutrino-nucleon elastic cross section have been identified as potentially key to ensuring that stalled bounce shocks are sufficiently re-energized to produce the desired explosion. An important source of such corrections can be found in a negative value for the nucleon’s strange helicity content $\Delta s$, which leads to the enhancement and suppression of the $\nu - p$ and $\nu - n$ total cross sections, respectively. In this talk, however, I summarize the results of a recent analysis which led to a comparatively small magnitude for the strange helicity ($\Delta s \geq -0.1$) — a fact which renders nucleon strangeness an unlikely candidate for the decisive missing ingredient necessary in simulations for CCSN explosions.

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