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# Nucleosynthesis around 60Fe

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Active nucleosynthesis in our galaxy can be observed directly through the detection of long-lived radioactivities. Isotopes such as $^{26}$Al, and $^{60}$Fe have been observed either in solar system samples or through $\gamma$-ray observations within the galaxy. Both isotopes are predominantly produced in massive stars and ejected into the interstellar medium either via stellar winds or through the supernova explosion. Instead of only looking at absolute observational values for each isotope, the ratio of $^{60}$Fe/$^{26}$Al can be used as a more sensitive probe since many of the observational uncertainties cancel out. In such a case, this ratio can be used to probe the production and emission of the two isotopes and the supernova mechanism itself. A long standing puzzle in our community is the fact that most theoretical models overpredict this ratio compared to the observational value. The discrepancy has been attributed to uncertainties in the nuclear reactions, and in particular the ones related to the production/destruction of $^{60}$Fe. Here we report on the main reaction producing $^{60}$Fe, namely the $^{59}$Fe(n,$\gamma$)$^{60}$Fe reaction. Previous work has constrained the $\gamma$-ray strength of $^{60}$Fe at energies above the neutron-separation energy (8.8 MeV). Here we will present the results of a $\beta$-Oslo measurement that extends the $\gamma$-ray strength measurement to lower energies. The presence of a significant upbend has severe implications on the reaction cross section. The impact of this result on the evolution and explosion of massive stars will be presented.

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