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Systematic study of (p,γ) and (α,γ) reactions on Nickel isotopes ANNA SIMON, NSCL/MSU, SUN COLLABORATION — The stable neutron-deficient isotopes of the elements from Se to Hg are synthesized during so called p-process. The modeling of p-process nucleosynthesis requires a large network of thousands of nuclear reactions involving stable nuclei as well as unstable, proton-rich nuclides. However, there are still very few charged-particle cross sections determined experimentally, despite big experimental efforts in recent years. Thus, the p-process rates involving charged projectiles are still based on theoretical cross sections obtained from modern Hauser–Feshbach statistical model calculations. It is crucial not only to measure cross sections for reactions that were shown to be particularly important for the p-process but also to provide systematic information on the (p,γ) and (α,γ) reactions for nuclei beyond iron in order to put constraints on the theoretical models. Here, the recent investigation of (p,γ) and (α,γ) reactions on stable Nickel isotopes will be presented. The obtained results will be compared to theoretical calculations that are commonly used in astrophysical models.

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