Nuclear Physics in Astrophysics - X



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Activations for lower s-process temperatures

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Heavy elements beyond iron are mainly synthesizing neutron capture reactions. The slow neutron capture process (s-process) is responsible for 50\,\% of the heavy elemental abundances. The corresponding neutron energies in the different astrophysical sites range from a few keV to about hundred keV. By using the activation technique, neutron capture reactions have been studied over the last decades at $k_{\rm B}T = 25$ \,keV. The neutrons were produced by protons impinging on a lithium target via the reaction ⁷Li(p,n)⁷Be. Neutrons are emitted within a 120 degree cone. With a modified approach, we measured neutron capture cross sections for lower s-process temperatures. With ring-shaped samples, a specific range of neutron emission angles is covered such that the neutron energy distribution corresponds to a Maxwell-Boltzmann distribution of $k_{\rm B}T = 7.75$ \,keV. The new technique and first results will be presented.

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