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Direct measurements of astrophysically important α-induced reactions[1]

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Understanding stellar evolution is one of the primary objectives of nuclear astrophysics. Reaction rates involving α-particles are often key nuclear physics inputs in stellar models. For instance, there are numerous (α, p) reactions fundamental for the understanding of X-ray bursts and the production of ^{44}Ti in core-collapse supernovae. Furthermore, some (α, n) reactions are considered as one of the main neutron sources in the s-process. However, direct measurements of these reactions at relevant astrophysical energies are experimentally challenging because of their small cross section and intensity limitation of radioactive beams. The active target system MUSIC offers a unique opportunity to study (α, p) and (α, n) reactions because its segmented anode allows the investigation of a large energy range in the excitation function with a single measurement. Recent results on the direct measurement of (α, n) and (α, p) measurements in the MUSIC detector will be discussed.

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