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Inverse kinematics measurement of the 18O(α, γ)22Ne reaction with DRAGON

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Have you ever wondered how all the elements we find here on Earth and in the universe were created? Nearly all naturally occurring elements are produced via nuclear reactions in the interiors of the stars. Half of the elements heavier than iron are synthesized in the slow neutron capture process (s-process), which occurs mainly in two astrophysical sites: asymptotic giant branch (AGB) stars (main s-process) and massive stars during core helium burning and shell carbon burning (weak s-process). The ^{18}O(α, γ)^{22}Ne reaction is a key link in determining the availability of ^{22}Ne in the stellar environment, which affects the amount of neutrons available for the s-process through the ^{22}Ne(α, n)^{25}Mg reaction. The ^{18}O(α, γ)^{22}Ne reaction was measured in inverse kinematics for the first-time using the DRAGON recoil separator at TRIUMF, Canada's particle accelerator centre. In this talk, I will present the scientific motivation for studying this reaction, the experimental setup, and progress on the analysis so far. I will also discuss potential future plans for additional measurements of the ^{18}O(α, γ)^{22}Ne reaction with DRAGON.

References

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