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An indirect study of the ^{44}Ti(α,p)^{47}V stellar rate using high precision ^{50}Cr(p,t)^{48}Cr reaction measurements A. LONG, G.P.A. BERG, Y. CHEN, M. COUDER, J. GOERRES, Z. MEISEL, M. WIESCHER, University of Notre Dame, P. ADSLEY, P. PAPKA, J.J. VAN ZYL, Universiteit Stellenbosch University, R. NEVELING, F.D. SMIT, iThemba LABS, L. PELLEGRI, University of the Witwatersrand — Observations of ^{44}Ti ejecta in core-collapse supernova by space-based γ-ray telescopes may provide a powerful probe into the underlying core-collapse explosion mechanisms. ^{44}Ti is believed to be produced just outside the collapsed core within regions undergoing α-rich freeze out and its synthesis is critically sensitive to temperature, density, and Y_e evolution. Present sensitivity studies have shown that the most influential reaction governing the synthesis of ^{44}Ti in this scenario is the ^{44}Ti(α,p)^{47}V reaction. Direct measurements of this reaction within the relevant astrophysical energies has proven difficult and therefore very little experimental information exist. The ^{44}Ti(α,p)^{47}V reaction reaction rate will depend strongly on the exact characteristics and number of natural parity states in ^{48}Cr that fall within the Gamow window. We have performed high energy-resolution zero-degree coincident measurements of the ^{50}Cr(p,t)^{48}Cr reaction at iThemba LABS with the motivation of precisely identifying energies and spins of (α,p) resonances in ^{48}Cr. Preliminary results will be presented.

Alexander Long
University of Notre Dame

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