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First direct measurement of the 83Rb(p,γ)84Sr Reaction STEPHEN GILLESPIE, TRIUMF — A key open question in the field of nuclear astrophysics relates to the production of heavy elements throughout our Galaxy. In particular, the origins of 35 n-deficient nuclides in between Se and Hg, that cannot be formed by neutron capture processes remain obscure. At present the production sites for p-nuclei are believed to be Type-II supernova, however a lack of experimental information on reaction rates makes any comparison with astrophysical observations extremely difficult. Sensitivity studies have been performed to identify reactions which significantly affect the production of p-nuclei, one of which is ^{83}Rb(p,γ) ^{84}Sr. Due to the energies involved in the p-process and the need for an intense beam of ^{83}Rb there is currently no experimental information on this reaction rate, or indeed any p-process rate involving a radioactive reactant. Using the newly commissioned recoil mass spectrometer EMMA in combination with the γ-ray spectrometer TIGRESS we have performed a direct measurement of the ^{83}Rb(p,γ)^{84}Sr reaction. This represents the first direct measurement of a supernova reaction using a radioactive beam in the Gamow energy window of p process burning. This talk will discuss the results of the measurement and its implications for the production of p nuclei.

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