26Al,30P(d,n) transfer reaction studies of key hydrogen burning resonances relevant for cosmic γ-ray emission and heavy element production in novae ANU KANKAINEN, PHIL WOODS, University of Edinburgh, E12010 COLLABORATION — 26Al(d,n)27Si and 30P(d,n)31S transfer reactions have been studied in inverse kinematics to study key astrophysical resonances in 27Si and 31S. These are relevant for abundance calculations of the cosmic γ-ray emitter 26Al, and for the abundances of heavy elements (e.g. silicon), highly dependent on the 30P(p,γ)31S reaction, observed in novae ejecta. A primary beam of 36Ar (150 MeV/A) impinging on a Be target produced around 30 MeV/u beams of 26Al and 30P which bombarded a 10 mg cm$^{-2}$-thick CD$_2$ target (CH$_2$ for background). The 27Si/31S ions were analyzed by the S800 spectrometer and identified by energy loss and time-of-flight measurements. γ rays from the decays of excited states in 27Si/31S were detected in coincidence with the recoiling 27Si/31S ions using GRETINA. By measuring the number of coincident events, and correcting for the angular distributions of the γ rays, this provides an angle integrated measurement of the (d, n) cross-sections, and a measure of the proton partial widths for the key astrophysical resonances in 27Si and 31S.

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Date submitted: 29 Jun 2013