Abstract Submitted
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The impact of the ^{26}Al^m(p,γ)^{27}Si reaction rate on the destruction of ^{26}Al in ONe novae[1] CATHERINE DEIBEL, Yale University, JAC CAGGIANO, PNL, JASON CLARK, Yale University, RACHEL LEWIS, University of York, ANUJ PARIKH, PETER PARKER, CHRISTOPHER WREDE, Yale University — Evidence of ongoing nucleosynthesis of ^{26}Al ($\tau_{1/2}$ = 7.2 x 10^5 yr) in our galaxy has been observed in the form of the 1.809 MeV γ-ray resulting from ^{25}Mg(p,γ)^{26}Al$^{g.s.}$($\beta^+\nu_e$)^{26}Mg* [1]. The ^{25}Mg(p,γ) reaction can also produce ^{26}Al^m, the short lived ($\tau_{1/2}$= 6.3 s), 0^+, isomeric state of ^{26}Al, which β^+-decays to ^{26}Mg$^{g.s.}$ only and must be treated separately from ^{26}Al$^{g.s.}$ at peak temperatures typical in novae (T$_9$ $\approx$ .1 - .35)[2]. Since ^{26}Al(p,γ)^{27}Si competes with the β^+-decay of ^{26}Al in novae, resonances in ^{26}Al$^{g.s./m}$(p,γ)^{27}Si may have a significant impact on ^{26}Al production. We have used the ^{28}Si(p,d)^{27}Si, ^{28}Si(^{3}He,α)^{27}Si*(p)^{26}Al, and ^{27}Al(^{3}He,t)^{27}Si*(p)^{26}Al reactions to study the ^{26}Al(p,γ)^{27}Si reaction. Several previously unpublished levels in ^{27}Si and proton decay branching ratios will be reported. Their impact on the ^{26}Al(p,γ)^{27}Si reaction rate and the nucleosynthesis of ^{26}Al in ONe novae will be discussed.

[1] Diehl, R. *et al.*, A&A, **449** (2006) 1025.
[2] Ward, R.A. and Fowler, W.A., ApJ, **238** (1980) 266.

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