Abstract Submitted
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Shell-model studies of the ^{29}P(p,γ)^{30}S reaction rate[1] W.A. RICHTER, iThemba LABS, Somerset West, South Africa, B. ALEX BROWN, Department of Physics and Astronomy, and NSCL, Michigan State University, East Lansing — In ^{30}S the properties of only the few lowest levels are well established. As the structure of proton unbound ^{30}S states is important for determining the ^{29}P(p,γ)^{30}S reaction rate, which influences explosive hydrogen burning in classical novae and type I X-ray bursters, we make use of a method based on the IMME (Isobaric Mass Multiplet Equation) to predict the properties of such states. We present results for levels in ^{30}S (the mirror of nucleus ^{30}Si). The calculated gamma-decay lifetimes and ^{29}P to ^{30}S spectroscopic factors together with experimental information on the levels of excited states are used to determine the ^{29}P(p,γ)^{30}S reaction rates based on the use of the USDA and USDB interactions. Some theoretical error estimates based on the use of different interactions are given. Our predictions also agree well with observations of two dominant states [1], $J^{\pi} = 3^{+}$ and 2^{+} around 4.7 and 4.8 MeV respectively.

[1] K. Setoodehnia et al., Phys. Rev C 82, 022801(R) (2010)

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