

An improved reaction rate for the $^{22}\text{Mg}(\alpha, p)^{25}\text{Al}$ and its implications on understanding type-I x-ray bursts

A new measurement of $^{25}\text{Al}+p$ resonant scattering was performed up to the astrophysically interested energy region of $^{22}\text{Mg}(\alpha, p)^{25}\text{Al}$. Several resonances were observed in the excitation functions, and their level properties have been determined based on an R-matrix analysis. An improved reaction rate of $^{22}\text{Mg}(\alpha, p)^{25}\text{Al}$ was determined based on the level properties of the corresponding resonances. The new rate advances a state-of-the-art model to remarkably reproduce light curves of the GS 1826–24 clocked burster with mean deviation < 9%.

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