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Nuclear physics of 26Al production

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The ground state of the unstable 26Al nucleus (26Alg) with T_1/2 = 0.717 Myr was the first radioisotope detected in the galaxy, via the characteristic 1.809 MeV gamma-emission of 26Mg. The observation is direct proof of ongoing stellar nucleosynthesis in our Galaxy and indicates that there are approximately 2-3 M_odot of 26Alg. It is therefore fundamental to understand the production of 26Alg and the effect of the nuclear physics uncertainty.
26Al has a isomeric state (26Alm) which is prohibited to decay into 26Alg due to the large spin difference. However, an equilibration between 26Alm and 26Alg could proceed via intermediate states and influence the abundance of 26Alg. Hence, the isomer could have an important influence on the production of 26Alg. To clarify the production mechanism of 26Alg in the winds of massive stars, we present our investigation of the sensitivity of the yields to variation of nuclear reaction rates involving 26Alg and 26Alm.

Primary author: LI, E. T. (Shenzhen University)

Presenter: LI, E. T. (Shenzhen University)

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