BETA-DELAYED CHARGED PARTICLE DECAYS OF NEUTRON-DEFICIENT NUCLEI ^{22,23}SI

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A novel arrangement of three double-sided Si strip detectors (DSSSD)[1] surrounded by 16 HPGe detectors was employed at NSCL (MSU, USA) to study the β-delayed charged particle decays of the neutron-deficient Si isotopes ^{22,23}Si. Detailed decay spectroscopy, including the measurements of the excitation energies for the isobaric analog states (IAS) in the ^{22,23}Al daughters was performed and new exotic decay pathways such as β2p were identified.

Using the isobaric mass multiplet equation (IMME)[2], the mass of ^{23}Si was deduced. The first indirect measurement of the mass of the lightest $T_Z = -3$ nucleus ^{22}Si will also be presented and compared to previous measurements and USDB shell model calculations, in order to assess whether its ground state is a candidate for 2p-radioactivity.

REFERENCES

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