

## LEVEL STRUCTURE OF $^{56}\text{Ti}$ AND THE POSSIBLE SHELL GAP AT $N=34$ \*

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A recent beta decay measurement [1] has established the first excited state of  $^{56}\text{Ti}$  to be located at 1127 keV; i.e., at a significantly lower energy than predicted by shell model calculations with the new full  $fp$  shell effective interaction GXFP1 [2]. This result is somewhat of a surprise in view of the success of the calculations in accounting for the level structure of many neutron-rich nuclei just above  $^{48}\text{Ca}$  [2]. In particular, the level sequences of the Ti and Cr isotopes, and the observed sub-shell closure at  $N = 32$  in  $^{54}\text{Ti}$  [3] and  $^{56}\text{Cr}$  [4] were reproduced satisfactorily.

Further information on the neutron-rich Ti isotopes was obtained at Gammasphere in a study of complex reactions of 330 MeV  $^{48}\text{Ca}$  projectiles with a thick  $^{238}\text{U}$  target. Coincidence cubes ( $\gamma\gamma\gamma$ ) and hypercubes ( $\gamma\gamma\gamma\gamma$ ) were constructed and from the analysis new information was obtained on the level structures of neutron-rich nuclei around  $^{48}\text{Ca}$ . In particular, the level scheme of  $^{56}\text{Ti}$  has now been firmly delineated up to  $6^+$ , tentatively up to  $8^+$ , giving further insight into shell structure above  $^{48}\text{Ca}$ . The data will be presented and compared with the latest calculations.

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