

Searching for Low-Energy Shape Coexistence in ^{80}Ge

Wednesday, 10 February 2021 12:30 (15)

Study of nuclear structure around the magic numbers is key to understanding the chart of nuclei. The region around ^{78}Ni is of interest, not only because it is one of the heavier doubly magic nuclei, but also because it has been proposed as a portal to the fifth island of inversion [Nowacki, F. *et al.* Phys. Rev. Lett. 117, 272501]. Evidence for low-lying shape coexistence near $N=40$ has been observed, but, until recently, no evidence of low-lying 0_2^+ states in the Ge isotopes near $N=50$ had been reported. An experiment at the ALTO facility identified a 0_2^+ state at 639 keV above the 0^+ ground state in ^{80}Ge [Gottardo, A. *et al.* Phys. Rev. Lett. 116, 182501]. However, β -decay studies using the GRIFFIN facility at TRIUMF, show no evidence for this state. Furthermore, the decay of a proposed (2^+) 2403-keV state to the 0_2^+ 639-keV state was not observed, nor was there other evidence for this state. Large-scale shell model calculations were performed, using two different valence spaces and interactions, for $^{78,80,82}\text{Ge}$. These calculations were able to reproduce the energies of known 0_2^+ , $2_{1,2}^+$ and 4_1^+ levels in these Ge isotopes. The 0_2^+ state in ^{80}Ge is predicted to be near 2 MeV and arises from the recoupling of valence particles. The search for this state, will be described, and the recently published findings [Garcia, F.H. *et al.* Phys. Rev. Lett. 125, 172501] will be presented.

email address

fatimag@sfu.ca

Please select: Experiment or Theory

Experiment

Primary author(s) : Ms GARCIA, Fatima H. (Simon Fraser University)

Co-author(s) : ANDREOIU, C.; BALL, G. C.; GARNSWORTHY, A. B.; NOWACKI, F.; PETRACHE, C. M.; POVES, A.; WHITMORE, K.; ALI, F. H.; BELL, A.; BERNIER, N.; BHATTACHARJEE, S. S.; BOWRY, M.; COLEMAN, R. J.; DILLMANN, I.; DJANTO, I.; FORNEY, A. M.; GASCOINE, M.; HACKMAN, G.; LEACH, K. G.; MURPHY, A. N.; NATZKE, C. R.; OLAIZOLA, B.; ORTNER, K.; PETERS, E. E.; RAJABALI, M. M.; RAYMOND, K.; SVENSSON, C. E.; UMASHANKAR, R.; WILLIAMS, J.; YATES, D.

Presenter(s) : Ms GARCIA, Fatima H. (Simon Fraser University)