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Shapes and structures in the neighborhood of ^{68}Ni: levels in ^{69}Cu[1]

WILLIAM WALTERS, University of Maryland — The study of the level structure of $^{68}Ni_{40}$ during the last 15 years has been intense, fueled by the presence of two excited 0^+ levels and a single excited 2^+ level below 2.6 MeV. [C. J. Chiara et al., Phys. Rev. C **86**, 041304 (R) (2012)] Recently, Tsunoda et al., have performed a series of calculations that indicate spherical, oblate, and prolate shapes for the ground, first excited 0^+ level at 1604 keV, and second excited 0^+ level at 2511 keV. [Y. Tsunoda, T. Otsuka, N. Shimizu, M. Honma, and Y. Utsuno, arXiv:1309.5851v1] One approach to gaining additional insight into these ideas is to examine the structure of $^{69}Cu_{40}$ that has a single proton coupled to ^{68}Ni. In this presentation, new levels and transitions will be presented for $^{69}Cu_{40.42}$ and discussed in the context of these three proposed shapes. Excited states in these nuclei were populated through multinucleon-transfer reactions using beams provided by the ATLAS facility at Argonne National Laboratory and studied with Gammasphere. From these data, an estimate of the barrier height separating the oblate and prolate shapes will be deduced.

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