Abstract Submitted
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Shape Coexistence in ^{72}Se[1] C.J. LISTER, S.M. FISCHER, E.A. MCCUTCHAN, Argonne National Laboratory IL 60439, T. AHN, R.J. CASPERSON, WNSL Yale CT 06511, A. HEINZ, G. ILIE, J. QIAN, E. WILLIAMS, R. WINKLER, WNSL Yale CT 06511 — One of the original candidates for shape co-existence in nuclei was ^{72}Se [1,2]. We have collected extensive new data, both "in-beam" following the ^{40}Ca(^{36}Ar,4p)^{72}Se reaction using Gammasphere at Argonne's ATLAS accelerator, and from the decay of ^{72}Br populated in the ^{58}Ni(^{16}O,pn) reaction studied at WNSL Yale. A new $J^{\pi}=0^{+}$ state was found at 1876 keV, the published [2] decay scheme was corrected, and twenty-six new levels were established. This detailed spectroscopy of low-lying states helps to delineate the two shape minima. The mixing of prolate-deformed and near-spherical states can be now quantified, and the gamma decay path from high-spin can be followed. The inferred groundstate shape is consistent with trends in experiment and calculation of the selenium isotopes [3,4].

[1] J.H. Hamilton, *et al.,* Phys. Rev. Letts. 32 239 (1974)
[2] W.E. Collins, *et al.,* Phys.Rev. C9, 1457 (1974)
[3] S.M. Fischer, *et al.,* Phys.Rev.Lett. 84, 4064 (2000)
[4] J. Ljungvall, *et al.,* Phys.Rev.Lett. 100, 102502 (2008)

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