Abstract Submitted for the DNP10 Meeting of The American Physical Society

Evolution of Shape in the Nucleus ⁷¹Se¹ S.M. FISCHER, DePaul University and Argonne National Laboratory, C.J. LISTER, Argonne National Laboratory — Nuclei near N = Z with A around 70-80 exhibit a variety of shapes and deformations, as well as shape coexistence within a single nucleus. Shapes are often inferred from the magnitudes and irregularities of moments of inertia of the observed rotational bands [1]. In some cases, the deformation of one or more low-lying states has been measured [2]. The $A \sim 70$ selenium nuclei are predicted to be oblate at low excitation, but quickly become prolate as the excitation energy and angular momentum increase. Excited states in ⁷¹Se were produced in the 4pn channel of the ³⁶Ar + ⁴⁰Ca reaction at 145 MeV. Both signatures of the $g_{9/2}$ band are observed, and at least three transitions between the two signatures are intense enough such that mixing ratios can be extracted. These mixing ratios allow us to track and quantify the evolution from oblate to prolate shape of this nucleus.

[1] S.M. Fischer et al., Phys. Rev. Lett. 84, 4064 (2000).

[2] A. Obertelli et al., Phys. Rev. C 80, 031304(R) (2009).

¹This work is supported by the U.S. Department of Energy, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357.

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Date submitted: 01 Jul 2010

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