Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Single-particle structure of silicon isotopes approaching ^{42}Si
RAGNAR STROBERG, ALEXANDRA GADE, VINCENT BADER, TRAVIS BAUGHER, Michigan State University / NSCL, DANIEL BAZIN, JILL BERRYMAN, NSCL, CHRIS CAMPBELL, Lawrence Berkeley National Lab, KIRBY KEMPER, Florida State University, CHRISTOPH LANGER, ANTOINE LEMASSON, SHUMPEI NOJI, FRANCESCO RECCHIA, DIRK WEISSHAAR, NSCL — ^{42}Si would seem to be a candidate for a magic nucleus with a filled N=28 neutron shell and a Z=14 proton subshell closure, however, experimental evidence has shown it to be collective [1]. It has been proposed that this breakdown is due to the monopole effect of the tensor force at large isospin, and that both proton excitations across Z=14 and neutron excitations across N=28 contribute to the increased collectivity of ^{42}Si [1,2]. To experimentally investigate the relative contributions of protons and neutrons to the collectivity, we have performed one-proton and one-neutron knockout reactions on ^{36,38,40}Si using the GRETINA array and S800 spectrometer at the NSCL. We will present preliminary results in comparison to large-scale shell model calculations.

[1] B. Bastin et al, Phys. Rev. Lett. 99, 022503 (2007)
[2] T. Otsuka et al, Phys. Rev. Lett. 95, 232502 (2005)

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Date submitted: 29 Jun 2013 Electronic form version 1.4