

Abstract Submitted  
for the DNP12 Meeting of  
The American Physical Society

**Collectivity in neutron-rich Cr isotopes**<sup>1</sup> S. SUCHYTA, S. LIDDICK, H. CRAWFORD, G. GRINYER, N. LARSON, J. PEREIRA, C. PROKOP, A. SCHNEIDER, S. VINNIKOVA, NSCL/MSU, C. CHIARA, U. of M./ANL, W. WALTERS, U. of M., M. CARPENTER, G. GURDAL, E. MCCUTCHAN, S. ZHU, ANL — Collectivity rapidly develops in neutron-rich nuclei near  $N = 40$  with  $Z < 28$  as protons are removed from the  $f_{7/2}$  single-particle state. This collectivity has been inferred from large drops in the energy of the first excited  $2^+$  state in even-even Cr and Fe isotopes, as well as an increase in  $B(E2)$  along the Fe isotopic chain. Shell-model calculations that include the neutron  $g_{9/2}$  and  $d_{5/2}$  single-particle states indicate that the enhanced collectivity can be attributed to multi-particle neutron excitations across the  $N=40$  gap. In the odd-odd nuclei, coexistence between spherical and deformed states has been proposed in the low-energy level structures of the Co and Mn isotopes. While recent studies of odd-A nuclei in this region have focused on the Co and Fe isotopes, less is known about the odd-A Cr isotopes. The structure of the odd-A Cr nuclei was investigated through the beta decay of neutron-rich V isotopes produced at the NSCL. The low-energy level schemes of the odd-A Cr isotopes will be presented and discussed.

<sup>1</sup>This work was supported in part by the National Science Foundation, Grant No. PHY-1102511 and the U.S. Department of Energy National Nuclear Security Administration under Award Number DE-NA0000979.

Scott Suchyta  
NSCL/MSU

Date submitted: 02 Jul 2012

Electronic form version 1.4