Abstract Submitted
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Probing $sd-pf$ cross-shell interactions via terminating configurations in $N \sim Z$ scandium isotopes[1] C.J. CHIARA, M. DEVLIN, E. IDEGUCHI, F. LERMA, W. REVIOL, S.K. RYU, D.G. SARANTITES, J.N. WILSON, Washington U., C. BAKTASH, A. GALINDO-URIBARRI, ORNL, D. RUDOLPH, Lund U., D.R. LAFOSSE, SUNY at Stony Brook, M.P. CARPENTER, R.V.F. JANSSENS, T. LAURITSEN, C.J. LISTER, P. REITER, D. SEWERYNIAK, ANL, P. FALLON, A. GÖRGEN, A.O. MACCHIAVELLI, LBNL — Comparisons of terminating states based on $f_{7/2}^n$ and $d_{3/2}^{-1}f_{7/2}^{n+1}$ configurations in $N \approx Z$, $A \approx 40$ nuclei can provide information about two-body matrix elements that are not well-defined in current realistic forces. Specifically, effective interactions can be studied by examining these $\pi d_{3/2}^{-1} f_{7/2}$ particle-hole excitations through states that have simple structural purity. The *sd-pf* nuclides $^{42}_{21}\mathrm{Sc}_{21}$ and $^{43}_{21}\mathrm{Sc}_{22}$ were produced via the αpn and αp channels, respectively, in two reactions: 84-MeV ^{20}Ne + ^{28}Si and 94-MeV ^{24}Mg + ^{24}Mg. Both experiments were performed using the Gammasphere spectrometer in conjunction with the Microball charged-particle detector array. States have been observed to excitation energies of 15 MeV and higher in both nuclei, and include candidates for the terminating states of interest. Shell-model and mean-field approaches are being applied to these results.

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