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Triple configuration coexistence in ^{44}S DANIEL SANTIAGO-GONZALEZ, Florida State University (FSU), I. WIEDENHOEVER, V. ABRAMKINA, M.L. AVILA, FSU, T. BAUGHER, D. BAZIN, NSCL, B.A. BROWN, NSCL, MSU, P.D. COTTLE, FSU, A. GADE, T. GLASMACHER, NSCL, MSU, K.W. KEMPER, FSU, S. MCDANIEL, NSCL, A. ROJAS, FSU, A. RATKIEWICZ, R. MEHARCHAND, NSCL, E.C. SIMPSON, J.A. TOSTEVIN, U. of Surrey, A. VOLYA, FSU, D. WEISSHAAR, NSCL — The persistence or breaking of the N=28 shell closure at the drip line is of central importance to understand the modifications of the nuclear mean field in very exotic nuclei. We studied the nucleus ^{44}S by two-proton knockout from ^{46}Ar at the NSCL using the SeGA gamma-array at the S800 spectrograph. We analyzed the gamma-recoil and gamma-gamma-recoil coincidence events to study the excitations of ^{44}S. The logitudinal momentum distribution of reaction residues was used to find angular momentum assignment to the excited states. We report the observation of four new excited states, of which one is a strongly prolate deformed $J^\pi = 4^+$ state, as indicated by a shell-model calculation. Its deformation originates in a neutron configuration which is fundamentally different from the "intruder" configuration producing the ground state deformation. Consequently, we do not have three coexisting shapes in ^{44}S, but three coexisting configurations, corresponding to zero, one and two neutron particle-hole excitations.

Daniel Santiago-Gonzalez
Florida State University

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