Isomeric character of the $4^+$ state in $^{44}$S: Mechanisms of breaking of the N=28 shell\textsuperscript{1} J. PARKER IV, I. WIEDENHOVER, J. BAKER, P. COTTLE, D. MCPHERSON, M. RILEY, D. SANTIAGO-GONZALEZ, A. VOLYA, FSU, V. BADER, T. BAUGHER, D. BAZIN, A. GADE, T. GINTER, H. IWASAKI, C. LOELIUS, C. MORSE, F. RECCHIA, D. SMALLEY, R. STROBERG, D. WEISS-SHAAR, K. WHITMORE, NSCL, A. LEMASSON, GANIL, H. CRAWFORD, A. MACCHIAVELLI, LBL, K. WIMMER, CMU — The N=28 nucleus $^{44}$S exhibits a rich structure of excitations which illustrates different mechanisms of breaking the N=28 shell. A Coulomb excitation measurement \cite{1} and an implantation-decay experiment \cite{2} established the coexistence of 2p2h-deformed and 0p0h-spherical configurations. A two-proton knockout reaction \cite{3} indicated a $4^+$ state which shell model calculations suggest is likely isomeric, prolate-deformed and formed from a 1p1h configuration. A recent two-proton knockout experiment measured the lifetime of this $4^+$ state using the recoil distance method and the GRETINA array. Results for the lifetime of the $4^+$ state will be presented and its implication for the mechanisms of breaking the N=28 shell will be discussed.

\begin{thebibliography}{9}
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\textsuperscript{1}Supported by the National Science Foundation

John Parker IV
Florida State University

Date submitted: 30 Jun 2015
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