

Abstract Submitted
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First Discovery of an Isomeric State with a Penning Trap Mass Spectrometer¹ A.A. KWIATKOWSKI, M. BLOCK, C. BACHELET, G. BOLLEN, M. FACINA, C.M. FOLDEN III, C. GUENAUT, D.J. MORRISSEY, G.K. PANG, A. PRINKE, R. RINGLE, J. SAVORY, P. SCHURY, S. SCHWARZ, National Superconducting Cyclotron Laboratory, Michigan State University — An isomeric state of ^{65}Fe has been discovered at the Low Energy Beam and Ion Trap facility (LEBIT) at the NSCL. From its measured mass difference with the ground state, the new isomer is determined to have an excitation energy of 402(5) keV. Following the systematics of spin and energy levels of lighter isotopes, tentative spin assignments were made for the ground state and the observed isomer. In addition to ^{65}Fe , high-precision mass measurements were made of $^{63,64}\text{Fe}$ and $^{64-66}\text{Co}$ using the Penning trap mass spectrometer. The mass uncertainties of all isotopes have been reduced by a factor of 10-100 compared to previous experiments. Moreover, our measurement of ^{64}Co differs from the accepted value by about five standard deviations. One motivation for mass measurements in this region is the observed N=40 sub-shell closure.

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