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The β decay of ^{81}Zn and excitations of the ^{78}Ni core¹ STEPHEN PADGETT, ROBERT GRZYWACZ, MIGUEL MADURGA, CARROL BINGHAM, LUCIA CARTEGNI, STANLEY PAULAUSKAS, Tennessee, IAIN DARBY, MUSTAFA RAJABALI, K.U. Leuven, AGNIESZKA KORGUL, Warsaw, WOJTEK KROLAS, Polish Academy of Sciences, SERGEY ILYUSHKIN, JEFF WINGER, Mississippi State University, SEAN LIDDICK, Michigan State University, CHIARA MAZZOCCHI, INFN Italy, CARL GROSS, KRZYSZTOF RYKACZEWSKI, DAN SHAPIRA, Oak Ridge National Lab, JON BATCHELDER, UNIRIB, EDWARD ZGANJAR, Louisiana State University — The β decay of the neutron rich N=51 nucleus ^{81}Zn was investigated in order to establish the ground state configuration of ^{81}Zn and to study excited states in the N=50 isotone ^{81}Ga . A high detection efficiency, digital $\beta\gamma$ spectroscopy setup at the HRIBF (Oak Ridge) was used with an isotopically pure beam of ^{81}Zn . The ^{81}Zn decay properties result from a competition between high energy forbidden β decays to negative parity states and allowed Gamow-Teller transitions to positive parity, core excited states in ^{81}Ga . Our data on the β decay branching ratios suggest a $5/2^+$ assignment for the ^{81}Zn ground state. The analysis also establishes the N=50 shell gap energy near ^{78}Ni .

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