

Observation of Positive-Parity Bands in ^{109}Pd and ^{111}Pd

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The neutron-rich nuclei ^{109}Pd and ^{111}Pd were produced as fission fragments following the $^{30}\text{Si} + ^{168}\text{Er}$ reaction at a beam energy of 142 MeV. Using the identification based on the coincidences with the complementary fission fragments, the only positive-parity bands observed so far in ^{109}Pd and ^{111}Pd emerged from this work. A band, built on top of the $5/2^+$ ground state exhibiting $\Delta I = 1$ energy-level staggering was observed in each of these nuclei. Both nuclei of interest, ^{109}Pd and ^{111}Pd , are suggested to lie in the transitional region of Pd isotopes of maximum γ -softness. The ground states of both nuclei are predicted by TRS calculations to be extremely γ -soft with shallow triaxial minima. The first crossing in the new bands is proposed to be due to an alignment of $h_{11/2}^2$ neutrons.