ROTATIONAL STRUCTURES IN ^{125}La AND ALIGNMENTS IN A ≈ 130 NUCLEI[1]

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High-spin states in ^{125}La have been populated using the ^{94}Mo(^{40}Ca,2αp) reaction at a beam energy of 180 MeV. Four of the five previously known rotational structures have been extended to higher spin ($I \leq 71/2$) and excitation energy. In addition, three new sequences were observed, two of which form a strongly-coupled band. This latter structure is likely based on the [404]9/2 proton orbital, which is associated with strong deformation driving behavior in nearby Pr and Pm nuclei. A systematic examination of the crossing frequencies based on the alignment of $h_{11/2}$ protons and $h_{11/2}$ neutrons is also presented. The dependence of the crossing frequencies on deformation and Fermi surface can be experimentally inferred and evidence for reduced proton and possibly neutron pairing fields can be observed.

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[1]Abstract of paper submitted to Phys. Rev. C.

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