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Evidence for the coexistence of chiral doublet bands and stapler band in ^{81}Br

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High spin states of odd A ^{81}Br were populated using the $^{82}\text{Se}(^4\text{He}, p4n)$ reaction with the beam energy of 65 and 68 MeV. A pair of nearly degenerate negative parity bands were observed in this nucleus, as well as a negative parity dipole band. Based on the experimental characters of these bands, they were respectively interpreted as a pair of chiral doublet bands based on the $\pi(\text{fp}, g9/2g9/2)$ configuration and a stapler band. The interpretation was supported by the multiparticle rotor model and the self-consistent tilted axis cranking covariant density functional theory calculations. The present work suggests a new chiral configuration in the nuclear system, and provides the evidence for the coexistence of chiral doublet bands and stapler band in ^{81}Br .

Primary author: LIU, Chen (Shandong University, Weihai)

Co-author: Prof. WANG, Shouyu (Shandong University, Weihai)

Presenter: LIU, Chen (Shandong University, Weihai)

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