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Pseudospin-chiral quartet bands in ^{131}Ba

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In the past twenty years, great efforts have been devoted to chiral symmetry, from both theoretical and experimental sides. As the frontier of such researches, multiple chiral doublet bands (MχD) have been observed in several nuclei.
From an experiment performed in Legnaro, Italy, we found a level structure exhibiting multiple chiral doublet bands in ^{131}Ba, which include 2 negative-parity bands and 4 positive-parity bands. Many linking transitions have been found among the four positive-parity bands, which may be attributed to both chiral symmetry and pseudo-spin symmetry. A series of E1 linking transitions have been found between the positive and negative bands, which should be a result of octupole correlations. Comparing this structure with those in ^{133}Ce and ^{135}Nd, it seems that the effects of pseudo-spin symmetry and octupole correlations in ^{131}Ba are enhanced.

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