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Pair-truncated shell-model approach to the mass $A \sim 130$ region NAOTAKA YOSHINAGA, Department of Physics, Saitama University, KOJI HIGASHIYAMA COLLABORATION — There exist two prominent features in even-even nuclei in the mass $A \sim 130$ region. First, low-lying states of these nuclei exhibit the γ instability, which manifests in the energy staggering of even-odd spin states in the quasi-γ bands and also in some forbidden $E2$ interband transition rates. Second, at high-spins yrast bands of these nuclei show anomalous behavior, the so-called backbending phenomenon. It arises due to band crossing between the ground-state band and s band originating from the alignment of two neutrons in the $0h_{11/2}$ orbital. For a description of both the low-lying states and backbending phenomena, we proposed a new version of the pair-truncated shell model, where the even-even nuclear states were constructed from angular momenta zero (S), two (D) and four (G) collective pairs, and non-collective H pairs, which were made by two nucleons in the $0h_{11/2}$ orbitals. The model was applied to the even-even nuclei in this mass region, and reproduced well experimental energy spectra and electromagnetic properties.

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