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Effective interactions between neutrons and protons in the intruder orbitals NAOTAKA YOSHINAGA, Saitama University, KOJI HI-GASHIYAMA, Chiba Institute of Technology — Effective interactions between neutrons and protons in the high-j intruder orbitals in the medium mass nuclei are theoretically investigated using a simple collective model. In this model, a doubly-odd nucleus is described by one neutron in the  $0h_{11/2}$  orbital and one proton in the  $0g_{9/2}$  orbital, and the collective core representing the even-even part of the nucleus. The effective interactions between the neutrons and protons are written in terms of multipole interactions. The model reproduces well the energy levels of yrast and yrare bands including band head energies. It is found that the quadrupole neutron and proton interaction is dominant among other interactions, but octupole and hexadecapole interactions are important to reproduce band head energies.

Naotaka Yoshinaga Department of Physics, Saitama University

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