

Proxy-SU(3): A symmetry for heavy nuclei

D. Bonatsos¹, I.E. Assimakis¹, N. Minkov², A. Martinou¹, R.B. Cakirli³, R.F. Casten^{4,5}, K. Blaum⁶

¹Institute of Nuclear and Particle Physics, National Centre for Scientific Research "Demokritos", GR-15310 Aghia Paraskevi, Attiki, Greece

²Institute of Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, 72 Tzarigrad Road, 1784 Sofia, Bulgaria

³Department of Physics, University of Istanbul, 34134 Istanbul, Turkey

⁴Wright Laboratory, Yale University, New Haven, Connecticut 06520, USA

⁵Facility for Rare Isotope Beams, 640 South Shaw Lane, Michigan State University, East Lansing, MI 48824 USA

⁶Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, D-69117 Heidelberg, Germany

Abstract

The SU(3) symmetry realized by J. P. Elliott in the sd nuclear shell is destroyed in heavier shells by the strong spin-orbit interaction. On the other hand, the SU(3) symmetry has been used for the description of heavy nuclei in terms of bosons in the framework of the Interacting Boson Approximation, as well as in terms of fermions using the pseudo-SU(3) approximation. We introduce a new fermionic approximation, called the proxy-SU(3), and we comment on its similarities and differences with the other approaches.

References

- [1] D. Bonatsos, I. E. Assimakis, N. Minkov, A. Martinou, R. B. Cakirli, R. F. Casten, and K. Blaum, *Phys. Rev. C* **95** (2017) 064325.