Proton-Neutron Pairs in Heavy Deformed Nuclei

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Abstract

The microscopic justification of the emergence of SU(3) symmetry in heavy nuclei remains an interesting problem. In the past, the pseudo-SU(3) approach [1] has been used, with considerable success [2]. Recent results seem to suggest that the key for understanding the emergence of SU(3) symmetry lies in the properties of the proton-neutron interaction, namely in the formation of (S=1, T=0) p-n pairs in heavy nuclei, especially when the numbers of valence protons and valence neutrons are nearly equal. Although this idea has been around for many years, since the introduction of the Federman-Pittel mechanism [3], it is only recently that information about the p-n interaction could be obtained from nuclear masses [4, 5], which become available from modern facilities. Based on this information, a new coupling scheme for heavy deformed nuclei has been suggested [6] and is under development.

References

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