



Nuclear Theory

Embedded Representations and Quasi-Dynamical Symmetry

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This presentation explains why models with a dynamical symmetry often work extraordinarily well even in the presence of large symmetry breaking interactions. A model may be a caricature of a more realistic system with a "quasi-dynamical" symmetry. The existence of quasi-dynamical symmetry in physical systems and its significance for understanding collective dynamics in complex nuclei is explained in terms of the precise mathematical concept of an "embedded representation". Examples are given which exhibit quasi-dynamical symmetry to a remarkably high degree. Understanding this unusual symmetry and why it occurs, is important for recognizing why dynamical symmetries appear to be much more prevalent than they would otherwise have any right to be and for interpreting the implications of a model's successes. We indicate when quasi-dynamical symmetry is expected to apply and present a challenge as to how best to make use of this potentially powerful algebraic structure.

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