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Title: Hidden algebras for nonseparable and nondiagonalizable models with complex interaction

Abstract: A shape invariant nonseparable and nondiagonalizable two-dimensional model with quadratic complex interaction was first studied by Cannata, Ioffe, and Nishnianidze in 2010. I will discuss recent work in which this pseudo-hermitian system is re-examined with the purpose of exhibiting its hidden algebraic structure. Four ladder operators are used as building blocks for constructing gl(2) generators, acting within the set of associated functions belonging to the Jordan block corresponding to a given energy eigenvalue. This analysis is extended by constructing a sp(4) nd osp(1/4) superalgebra. Another shape invariant nonseparable and nondiagonalizable three-dimensional model was introduced by Bardavelidze, Cannata, Ioffe, and Nishnianidze in 2013. I will also discuss the hidden symmetry algebra of this pseudo-hermitian Hamiltonian related to gl(3) and the description of the associated states that form Jordan blocks. Those work allow to get insight into other type of models which are superintegrable. This talk will discuss recent works with Christiane Quesne, ULB, Belgium.

References:

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