

\mathcal{PT} –symmetry, Cartan decompositions, Lie triple systems and Krein space related Clifford algebras

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Gauged \mathcal{PT} quantum mechanics (PTQM) and corresponding Krein space setups are studied. For models with constant non-Abelian gauge potentials and extended parity inversions compact and noncompact Lie group components are analyzed via Cartan decompositions. A Lie-triple structure is found and an interpretation as \mathcal{PT} –symmetrically generalized Jaynes-Cummings model is possible with close relation to recently studied cavity QED setups with transmon states in multilevel artificial atoms. For models with Abelian gauge potentials a hidden Clifford algebra structure is found and used to obtain the fundamental symmetry of Krein space related J –selfadjoint extensions for PTQM setups with ultra-localized potentials.

The talk is based on arXiv:1006.1134[math-ph] – a joint work with S. Kuzhel.