

Rotation and vibration in tetraquarks

Exact solutions for energy spectra and eigenstates for Tetraquarks are found by using an infinite dimensional algebraic method. The Interacting Boson Model, as proposed by Arima and Iachello [1], includes two types of bosons with angular momentum $L = 0$ (s bosons) and $L = 2$ (d bosons) in a two-level system. Exact eigen-energies and the corresponding wavefunctions of an interacting four-level pairing in a transitional region of rotation and vibration limits are obtained by using the bethe ansatz method. To analyze the vibration and rotational limits, similar to Refs. [2-4], the $SU(1,1)$ pairing algebra is introduced. The solvable approach presented in this lecture may also be helpful in diagonalizing more general multi-quark systems.

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Primary author: JALILI, Amir (Nankai University)

Co-authors: Prof. PAN, Feng (Liaoning Normal University); SEGOVIA, Jorge; Prof. LUO, Yan An (Nankai University)

Presenters: JALILI, Amir (Nankai University); SEGOVIA, Jorge

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