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BC_2 Lame polynomials

BC_2 elliptic Hamiltonian is two-dimensional Schroedinger operator with double-periodic potential of a special form which does not admit separation of variables. In space of orbits of double-affine BC_2 Weyl group the similarity-transformed Hamiltonian takes the algebraic form of the second order differential operator with polynomial coefficients. This operator has a

finite-dimensional invariant subspace in polynomials which is a

finite-dimensional representation space of the algebra gl(3). This space is invariant wrt $2D$ projective transformations. BC_2 Lame polynomials are the eigenfunctions of this operator, supposedly, their eigenvalues define edges of the Brillouin zones (bands).