

Point group interpretation of Galois symmetry of Bethe Ansatz solutions of magnetic pentagonal ring

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Exact solutions of the eigenproblem of the magnetic pentagonal ring exhibit the arithmetic symmetry expressed in terms of a Galois group of a finite extension of the prime field \mathbb{Q} of rationals. We propose here a geometric interpretation of this symmetry in the interior of the Brillouin zone in terms of point groups. Explicitly, it is a subgroup of the direct product $D_4 \times C_4$. We present also the appropriate irreducible representations of the group.