

A higher rank generalization of the Bannai-Ito algebra

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The kernel of the \mathbb{Z}_2^n Dirac-Dunkl operator is examined by determining the symmetry algebra A_n of the associated Dirac-Dunkl equation, which is shown to correspond to a higher rank generalization of the Bannai-Ito algebra. A basis for the polynomial null-solutions of the Dirac-Dunkl operator is constructed. The basis elements are joint eigenfunctions of a maximal commutative subalgebra of A_n and are given explicitly in terms of Jacobi polynomials. The symmetry algebra is shown to act irreducibly on this basis via raising/lowering operators. A scalar realization of A_n is proposed. Finally, it is conjectured that the multivariate Bannai-Ito polynomials will arise as overlap coefficients between different sets of basis elements.

References

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