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Structure of the kernel of higher spin Dirac operators

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Abstract: Polynomials on $\mathbb{R}^n$ with values in an irreducible $Spin_n$-module form a natural representation space for the group $Spin_n$. These representations are completely reducible. In the paper, we give a complete description of their decompositions into irreducible components for polynomials with values in a certain range of irreducible modules. The results are used to describe the structure of kernels of conformally invariant elliptic first order systems acting on maps on $\mathbb{R}^n$ with values in these modules.

Keywords: conformally invariant differential operators, generalized (higher-spin) Dirac operators, representations of spin-groups, Littlewood-Richardson rule
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