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Journal of Lie Theory 18 (2008) 757–774

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Generalized Dolbeault Sequences in Parabolic Geometry

We show the existence of a sequence of invariant differential operators on a particular homogeneous model G/P of a Cartan geometry. The first operator in this sequence is closely related to the Dirac operator in k Clifford variables, $D = (D_1, \dots, D_k)$, where $D_i = \sum_j e_j \cdot \partial_{ij} : C^\infty((\mathbb{R}^n)^k, SS) \rightarrow C^\infty((\mathbb{R}^n)^k, SS)$. We describe the structure of these sequences in case the dimension n is odd. It follows from the construction that all these operators are invariant with respect to the action of the group G . These results are obtained by constructing homomorphisms of generalized Verma modules, which are purely algebraic objects.

Keywords: Dirac operator, parabolic geometry, BGG, generalized Verma module.

MSC: 58J10, 34L40