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### *Transvector algebras in Clifford analysis*

#### **Abstract**

In higher spin Clifford analysis, it is known that any representation of the  $\text{Spin}(m)$ -group with a half-integer highest weight  $\lambda' = (l_1 + \frac{1}{2}, \dots, l_k + \frac{1}{2}, \frac{1}{2}, \dots, \frac{1}{2})$  can be modelled by the space of simplicial monogenic polynomials in  $k$  vector variables  $u_1, \dots, u_k$ , homogenic of degree  $l_i$  in  $u_i$  for each  $i \in \{1, \dots, k\}$ . We denote this space by  $\mathcal{S}_\lambda$ , see [1].

The theory of generalised gradients (e.g. [2, 4]) tells us that the only conformally invariant first order differential operators acting on the representation  $\mathbb{R}^m \otimes \mathcal{S}_\lambda$  (which can be identified with the space of polynomials  $\mathcal{C}^\infty(\mathbb{R}^m, \mathcal{S}_\lambda)$ ) are the higher spin Dirac operator  $\mathcal{Q}_\lambda$ , at most  $k$  twistor operators, and at most  $k + 1$  dual twistor operators.

In this talk, it will be shown that these differential operators can be seen as generators of a suitable algebra, hereby generalising the well-known fact that the classical Dirac operator and its symbol generate the orthosymplectic Lie algebra  $\mathfrak{osp}(1, 2)$ . To do so, we will use the extremal projection operator and its relation to transvector algebras (see e.g. [3, 5, 6]).

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