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On the second $\mathfrak{osp}(1|2)$-relative cohomology of the Lie superalgebra of contact vector fields on $\mathcal{C}^{1|1}$.

Abstract

Let $\mathcal{K}(1)$ be the Lie superalgebra of contact vector fields on the (1,1)-dimensional complex superspace; it contains the Möbius superalgebra $\mathfrak{osp}(1|2)$. We classify $\mathfrak{osp}(1|2)$-invariant superantisymmetric binary differential operators from $\mathcal{K}(1) \wedge \mathcal{K}(1)$ to $\mathfrak{D}_{\lambda,\mu}$ vanishing on $\mathfrak{osp}(1|2)$, where $\mathfrak{D}_{\lambda,\mu}$ is the superspace of linear differential operators acting on the superspaces of weighted densities. This result allows us to compute the second differential $\mathfrak{osp}(1|2)$-relative cohomology of $\mathcal{K}(1)$ with coefficients in $\mathfrak{D}_{\lambda,\mu}$.