

Branes, Supergravity and Lie Superalgebra Cohomology

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Abstract

This research aims to connect some mathematical notions typical of supermanifolds with the study of branes and supergravity. In particular, I am working on Lie superalgebra cohomology not on superforms, but rather on pseudoforms. It is long known that algebraic cohomology classes are linked to supergravity multiplets (see, e.g., the works by Castellani, d'Auria and Fré) and to the classification of branes (see the recent works by Fiorenza, Sati and Schreiber). Moreover, the dual interpretation of such cohomology groups in terms of homotopy algebras is of great interest to the mathematical community as well. My goal is to use the full-fledged power of supergeometry to extend the constructions of Free Differential Algebras (see also Sullivan) to these new classes and eventually to study their interpretation in terms of superbranes.