Witten, Edward
Notes on supermanifolds and integration. (English) ⏹ Zbl 1421.58001
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As far as applications of supermathematics to physics, merely the most basic facts about supermanifolds are all in all sufficient. As is well known, there are some exceptions to every rule. Concerning the above saying about supergeometry, the remarkable exception is superstring perturbation theory in the RNS formalism, which is usually formulated in terms of integration on the moduli space of super Riemann surfaces and the issues are very subtle. The principal objective in this paper is to present background material on supermanifolds and integration, collecting in a relatively simple way some background material for a reconsideration of superstring perturbation theory [ibid. 15, No. 1, 517–607 (2019; Zbl 1421.81102)]. A companion article [ibid. 15, No. 1, 57–211 (2019; Zbl 1423.32012)] will contain background material on super Riemann surfaces.

This paper consists of 5 sections, §1 being an introduction. §2 gives a description of a supermanifold, while §3 gives a sketch of the theory of integration on supermanifolds. §4 gives a description of some interesting operations on pseudoforms, largely on the lines of [*A. Belopolsky*, "De Rham cohomology of the supermanifolds and superstring BRST cohomology", Phys. Lett., B 403, No. 1–2, 47–50 (1997; `doi:10.1016/S0370-2693(97)00445-0`); "New geometrical approach to superstrings", Preprint, `arXiv:hep-th/9703183`]. §5 is devoted to comparing complex supermanifolds to smooth ones.

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Cited in **3** Reviews
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