SMOOTH SUPERMANIFOLDS AND THEIR APPLICATIONS

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Program

(1) Superdomains and functions. Morphisms. Substitution rule.
(2) Vector fields. Derivations. Differential equations. Flows. Lie derivative.
(3) Graded domains.
(4) Differential forms. Pullbacks. Exterior derivative. Lie derivative. Cartan's calculus.
(5) Symplectic forms. Poisson brackets. Differential graded symplectic domains.
(6) Integration. Berezin integral. Change of variables. Berezinian. Pfaffian. Supertrace. Divergence operator. BV integration.
(7) Global theory. Morphisms. Vector fields, differential forms, differential graded symplectic manifolds. Global integration theory. Berezinian densitites. Integral forms.
(8) Application to Poisson geometry, Courant algebroids, generalized complex structures.

References

[1] Claudio Carmeli, Lauren Caston, Rita Fioresi, *Mathematical Foundations of Supersymmetry*, EMS
[2] A. S. Cattaneo, F. Schätz, Introduction to supergeometry, Rev. Math. Phys. 23, 669–690 (2011), arXiv:1011.3401
[3] Daniel S. Freed, *Five Lectures on Supersymmetry*, AMS
[4] Alice Rogers, *Supermanifolds. Theory and Applications*, World Scientific
[5] V. S. Varadarajan, *Supersymmetry for Mathematicians: An Introduction*, AMS and Courant Institute, 2004
[6] T. Voronov, *Geometric Integration Theory on Supermanifolds*, Cambridge Scientific Publishers (2014)