DIFFERENTIAL GEOMETRY STRUCTURE FOR FORMAL MAPS

ROMAN KADOBIANSKI and VITALY KUSHNIREVITCH

Abstract

Usually, differential geometry is formulated in the terms of smooth maps of smooth manifolds. The conception proposed by I.M.Gel'fand and Yu.L.Daletskii is to replace smooth manifolds by formal one. The formal manifold is the pair (A, M), where A is Lie algebra and M is a module over it. Let $L_k(X, Y)$ be k-linear map from X to Y; $(X, Y) = \prod_{k=1}^{\infty} L_k(X, Y)$. Formal map is defined as sequence $a = (a_1, a_2, \dots) \in (X, Y)$, $a_k \in L_k(X, Y)$. The natural further step is to use formal maps instead of smooth ones. It turns out that Lie algebra structure and module over it can be defined in the space of formal maps. So, differential geometry of formal maps can be constructed. For example, such construction is useful in nonlinear partial diferential equations theory and for different nontrivial dynamical systems in physics.

Roman KADOBIANSKI, National Technical University of Ukraine "Kiev Polytechnic Institute", UKRAINE, e-mail: tskafits@adam.kiev.ua

Vitaly KUSHNIREVITCH, National Technical University of Ukraine "Kiev Polytechnic Institute", UKRAINE, e-mail: tskafits@adam.kiev.ua