Gel’fand, I. M.; Daletskij, Yu. L.; Tsygan, B. L.
On a variant of noncommutative differential geometry.  (English. Russian original)
Zbl 0712.17026

A new notion is invented, that of a \((\mathfrak{U}, \mathfrak{D})\)-system, enabling one to treat in a uniform way a number of earlier known concepts and constructions. Among those are the Berezin-Marinov classical particle spin dynamics, a graded version of formal variational calculus due to Yu. L. Daletskij, and the cyclic homology. Let \(\mathfrak{U}\) and \(\mathfrak{D}\) be graded vector spaces; a \((\mathfrak{U}, \mathfrak{D})\)-system is a triple consisting of a Lie superalgebra \(\mathfrak{g}\) and two linear mappings \(\alpha : \mathfrak{U} \to \mathfrak{g}\), \(\beta : \mathfrak{D} \to \mathfrak{g}\) with some special properties. (All the gradings take their values in an Abelian group direct sum of finitely many copies of \(\mathbb{Z}\) and/or \(\mathbb{Z}_2\).)

The main topics discussed include examples of \((\mathfrak{U}, \mathfrak{D})\)-systems and the so-called \((\mathfrak{U}, \mathfrak{D})\)-structures; representations of new objects in graded vector spaces; related cohomology. As an application, it is observed that the Hochschild cohomology space \(H^*\) of any associative superalgebra carries a certain natural Lie superalgebra structure.

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MSC:
- 17B70 Graded Lie (super)algebras
- 17A70 Superalgebras
- 58C50 Analysis on supermanifolds or graded manifolds
- 55N35 Other homology theories in algebraic topology

Keywords:
vector superspace; cyclic homology; Lie superalgebra; \((\mathfrak{U}, \mathfrak{D})\)-systems; \((\mathfrak{U}, \mathfrak{D})\)-structures; Hochschild cohomology