

Ferrero, Miguel; Haetinger, Claus

Higher derivations of semiprime rings. (English) Zbl 1010.16028
Commun. Algebra 30, No. 5, 2321-2333 (2002).

A family of additive maps $(d_i)_{i \geq 0}$ of a ring R is called a higher derivation if $d_0 = \text{id}_R$ and $d_n(ab) = \sum_{i=0}^n d_i(a)d_{n-i}(b)$ for all $a, b \in R$ and $n \geq 0$. For example, if R is an algebra over \mathbb{Q} and d is a derivation of R , then $(\frac{d^n}{n!})_{i \geq 0}$ is a higher derivation. The main topic of the paper is the condition $\sum_{i=0}^n a_i d_i(x) = 0$ for all $x \in R$, where the a_i 's are some fixed elements, (d_i) is a higher derivation, and R is a semiprime ring. Roughly speaking, under certain assumptions the authors describe the structure of a higher derivation satisfying this condition. In particular, some results can be considered as generalizations of *V. K. Kharchenko's* well-known theorem on algebraic derivations of prime rings [*Algebra Logika* 17, 220-238 (1978; [Zbl 0423.16011](#))].

Reviewer: [M. Brešar \(Maribor\)](#)

MSC:

[16W25](#) Derivations, actions of Lie algebras
[16N60](#) Prime and semiprime associative rings
[16R50](#) Other kinds of identities (generalized polynomial, rational, involution)

Cited in **18** Documents

Keywords:

[additive maps](#); [higher derivations](#); [semiprime rings](#); [algebraic derivations](#); [prime rings](#)

Full Text: [DOI](#)

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