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Associative n-Tuple algebras

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Abstract

In the paper,we study algebras having n bilinearmultiplication operations [InlineMediaObject not available: see fulltext.]: A×A → A, s = 1, ..., n, such that (a[InlineMediaObject not available: see fulltext.]b) [InlineMediaObject not available: see fulltext.]c = a[InlineMediaObject not available: see fulltext.] (b[InlineMediaObject not available: see fulltext.]c), s, r = 1,..., n, a, b, c ∈ A. The radical of such an algebra is defined as the intersection of the annihilators of irreducible A-modules, and it is proved that the radical coincides with the intersection of the maximal right ideals each of which is s-regular for some operation [InlineMediaObject not available: see fulltext.]. This implies that the quotient algebra by the radical is semisimple. If an n-tuple algebra is Artinian, then the radical is nilpotent, and the semisimple Artinian n-tuple algebra is the direct sum of two-sided ideals each of which is a simple algebra. Moreover, in terms of sandwich algebras, we describe a finite-dimensional n-tuple algebra A, over an algebraically closed field, which is a simple A-module. © 2014 Pleiades Publishing, Ltd.

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Keywords

Artinian algebra, commutator algebra, n-tuple algebra, radical, sandwich algebra, semisimple algebra