Identities of Spaces of Linear Transformations and Nonassociative Linear Algebras

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Let F be a field, A be an linear associative F-algebra and let E be a subspace in A (but E not necessary subalgebra of A) which generate A how linear F-algebra. In this case, we call E a *multiplicative vector space* (in short, an *L-space*) over the field F. The algebra A will be called *enveloping for the space* E, and the space E will be called *embedded in the algebra* A.

The identity of an L-space E over a field F (embedded in an F-algebra A) is an associative polynomial $f(x_1, x_2, \ldots, x_n)$ which equal to zero in A if, instead of its variables $x_1, x_2, \ldots, x_n$ we substitute any elements from E. The identity of the multiplicative vector space E (with the enveloping algebra A) can be considered as a weak identity of the pair (A, E). The pair (A, E) in this case will be called a *multiplicative vector pair*.

Let $G \subseteq F\langle X\rangle$. The class of all multiplicative vector pairs of the form (A, E) satisfying all the identities of the set G is called an *L-variety defined by the set of identities* G. If G is a basis of identities in the space E, then the L-variety defined by the set of identities G called the *L-varieties generated by the space* E.

In this report, the main results on multiplicative vector spaces, identities of multiplicative vector spaces and L-varieties are presented. We also present the consequences of the obtained results for non-associative linear algebras.