PRIMARY DECOMPOSITIONS OF UNITAL LOCALLY MATRIX ALGEBRAS AND STEINITZ NUMBERS

BOGDANA OLIYNYK

ABSTRACT

Let F be a ground field. An F-algebra A with unit 1 is said to be a locally matrix algebra if an arbitrary finite collection of elements $a_1, \ldots, a_s$ from A lies in a subalgebra B with 1 of the algebra A, and B is isomorphic to a matrix algebra $M_n(F)$, $n \geq$. We assign a Steinitz number $\mathbf{n}(A)$ to an arbitrary unital locally matrix algebra A.

In this talk, we outline the construction of a unital locally matrix algebra of uncountable dimension that does not admit a primary decomposition. It gives negative answers to the question posed in
V. M. Kurochkin, *On the theory of locally simple and locally normal algebras* (Russian), Mat. Sb., Nov. Ser. **22(64)** (1948), no. 3, 443–454.

We also show that for an arbitrary infinite Steinitz number s there exists a unital locally matrix algebra A having the Steinitz number s and being not isomorphic to a tensor product of finite dimensional matrix algebras.

This talk is based on the joint works with Oksana Bezushchak.