DEFINABILITY AND DEGREE STRUCTURES IN THE ERSHOV HIERARCHY

M. M. YAMALEEV

In our talk we will consider the degree structures induced by various strong and weak reducibilities (in particular, by c-, m-, wtt-, T-, and e-reducibilities). In 1971 B. Cooper in his PhD thesis proved that each finite level in the Ershov hierarchy is proper (relative to Turing reducibility). Thus, it motivated an intensive studying of different substructures of the above-mentioned structures. There were obtained many structural and model-theoretic properties for the first and second levels of the Ershov hierarchy, which are computably enumerable and 2-computably enumerable degrees, correspondingly. In particular, it was shown that the Turing degree structures for these levels are not elementarily equivalent. Though, it is still open (and currently one of the most intriguing) the following question: are computably enumerable Turing degrees definable in the partial ordering of 2-computably enumerable Turing degrees?

The main goal of our talk is to give a review of recent achievements on the definability questions for lower levels of the Erhsov hierarchy in the structures of higher levels. The special interest will present definability of the computably enumerable degrees in different substructures in the first order language of partial ordering. Also we will consider different structural properties which allow to interpret lower levels in the structures of higher levels.

Kazan Federal University, Kazan (Russia)
E-mail address: mars.yamaleev@kpfu.ru