Summary: Given a structure $\mathcal{M}$ over $\omega$ and a syntactic complexity class $\mathcal{C}$, we say that a subset is $\mathcal{C}$-definable in $\mathcal{M}$ if there exists a $\mathcal{C}$-formula $\Theta(x)$ in the language of $\mathcal{M}$ such that for all $x \in \omega$, we have $x \in \mathcal{A}$ iff $\Theta(x)$ is true in the structure. S. S. Goncharov and N. T. Kogabaev [Vestnik NGU, Mat., Mekh., Inf., 8, No. 4, 23-32 (2008)] generalized an idea proposed by Friedberg [J. Symb. Log., 23, No. 3, 309-316 (1958)], introducing the notion of a $\mathcal{C}$-classification of $\mathcal{M}$: a computable list of $\mathcal{C}$-formulas such that every $\mathcal{C}$-definable subset is defined by a unique $\mathcal{C}$-formula in the list. We study the connections among $\mathcal{C}_1^0$-classifications in the context of two families of structures, unbounded computable equivalence structures, and unbounded computable injection structures. It is stated that every such injection structure has a $\Sigma_1^0$-classification, a $\Sigma_1^0$-classification, and a $\Sigma_2^0$-classification. In equivalence structures, on the other hand, we find a richer variety of possibilities.

MSC:

03C57 Computable structure theory, computable model theory  
03D45 Theory of numerations, effectively presented structures  
03C40 Interpolation, preservation, definability

Keywords:

$\Sigma_1^0$-classification; $d-\Sigma_1^0$-classification; $\Sigma_2^0$-classification; unbounded computable equivalence structure; unbounded computable injection structure

Full Text: DOI

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