

PRESENTATIONS OF STRUCTURES IN ADMISSIBLE SETS
AND ON NATURAL NUMBERS

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Following [1], for a countable structure \mathfrak{M} of computable signature we consider the set of all possible presentations of \mathfrak{M} on natural numbers. The set of characteristic functions of the atomic diagrams of such presentations forms the mass problem $\underline{\mathfrak{M}}$ – the problem of presentability of \mathfrak{M} . For arbitrary countable structures \mathfrak{M} and \mathfrak{N} , we consider the following properties:

- 1) $\underline{\mathfrak{M}}$ is Σ -definable in $\mathbb{H}\mathbb{F}(\mathfrak{N})$;
- 2) $\underline{\mathfrak{M}} \leq (\underline{\mathfrak{N}}, \bar{n})$ for some $\bar{n} \in N^{<\omega}$ (\leq is the Medvedev reducibility);
- 3) $\underline{\mathfrak{M}} \leq_w \underline{\mathfrak{N}}$ (\leq_w is the Muchnik reducibility).

It is easy to see that, for any \mathfrak{M} and \mathfrak{N} , 1 implies 2 and 2 implies 3. Yet in general these conditions are not equivalent. We introduce a series of examples showing that. On the other hand, we introduce some sufficient conditions under which 1, 2 and 3 are equivalent, and study the situation for some natural classes of structures.

We also study degree spectra of countable structures in admissible sets of the form $\mathbb{H}\mathbb{F}(\mathfrak{N})$, where \mathfrak{N} is countable. A characterization of structures having a degree is found, some examples are presented.

[1] A.I. Stukachev, On mass problems of presentability. J.-Y. Cai, S.B. Cooper, and A. Li (Eds.): TAMC20006: Theory and Applications of Models of Computation. LNCS **3959** (2006) 774-784

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