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SOME REMARKS ON DEFINABLE QUANTIFIERS

1. Let $\phi(r)$ be a first-order sentence with relational symbols $r = < r_0, \ldots, r_{n-1} >$. For any language L let us define a generalized logic $L(Q_{\phi(r)})$ with the following semantics:

$$M \models Q_{\phi(r)}\psi(r) \text{ if for some relations } R_0, \ldots, R_{n-1} \text{ on } M,\ M \models \phi(R)\&\psi(R).$$

S. Shelah proved that $L(Q_{\phi(r)})$ is bi-interpretable with one of the following logics: second-order logic $L(Q_2)$, permutation logic $L(Q_{1-1})$, monadic logic $L(Q_{mon})$ and usual first-order logic.

We consider the finite axiomatizable theory $T_{\phi(r)}$ with axiom $\phi(R)$. For some natural classes of formulas $\phi(r)$ we describe $T_{\phi(r)}$ where $L(Q_2)$ is not interpretable in $L(Q_{\phi(r)})$.

2. A first-order theory T is said to be monadic stable if its $L(Q_2)$-theory is not interpretable in its monadic theory. We prove the monadic stability of ω-categorical $\forall\cup\exists$-axiomatizable theory with trivial closure acl.

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