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Joachim Mueller-Theys* (mueller-theys@gmx.de). *Metalogical Extensions*. Preliminary report.

Non-theoremhood—as with $x \circ y = y \circ x$ and group theory—cannot be formalised by logics like FOL. This has motivated adding new formulæ $\Theta(\alpha)$ and defining a *metalogical extension* \mathcal{S} to be a conservative extension of the given consequence, having tautologies, modus ponens, replacement, and the specific properties:

$\Sigma \vdash \phi$ implies $\Sigma \mathcal{S} \Theta(\phi)$, and

$\Sigma \not\vdash \phi$ implies $\Sigma \mathcal{S} \neg \Theta(\phi)$,

reflecting the ways theorems and non-theorems are usually established.

We could realise \mathcal{S} deductively and semantically, and it turned out that there exists only one ME, whence, in particular, $\Sigma \Vdash \alpha$ iff $\Sigma \models \alpha$.

Further information, especially regarding the relation to modal logic (where $\Box\alpha$ appears as a notational variant of $\Theta(\alpha)$) and to immanent attempts of self-representation (by formulæ $\phi = \theta(\ulcorner\alpha\urcorner)$), can be found e. g. in the ASL-abstract and *The Bulletin of Symbolic Logic* **25** (2019), p. 272. (Received September 16, 2019)