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Michael Makkai* (michael.makkai@mcgill.ca). *The model theory of first-order logic with dependent sorts*. Preliminary report.

First-order logic with dependent sorts, FOLDS for short, was introduced by the author in 1995. Its syntax is very simple, and by itself the syntax cannot be regarded an original contribution. The main new idea is the notion of FOLDS equivalence. FOLDS removes and generalizes the Fregean identity (equality) notion, accepted as a logical primitive in usual model theory, and it replaces it by FOLDS equivalence, a non-primitive concept that is constructed within the language of FOLDS without any use of the Fregean concept. FOLDS is motivated and applied in category theory, and in particular, for higher-dimensional categories. The talk will present a generalization to FOLDS of Lindstrom's well-known model-theoretical characterization of first-order logic. The generalization replaces the notion of isomorphism, recognized as basic in Lindstrom's original work, by FOLDS equivalence. This generalization necessitates the replacement of the usual syntax of first-order logic with the somewhat more elaborate syntax of FOLDS. The basic outline of Lindstrom's proof is present in the proof of the new result. On the other hand, the use of a categorical language for the formulation and the proof of the new result seems to be unavoidable. (Received September 13, 2014)