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**Thomas Hales\***, Math Department, 416 Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260. *The Formalization of Mathematics and Controlled Natural Language.*

By a controlled natural language for mathematics, we mean an artificial language for the communication of mathematics that is deliberately designed with precise computer-readable syntax and semantics, is based on a single natural language (which for us will be English), and is broadly understood at least in an intuitive way by mathematically literate speakers of the natural language.

We have recently designed a controlled natural language for mathematics. Text written in this language may almost appear to be ordinary mathematical text, but the grammar is precisely specified and computer readable, eventually as expressions in the Lean theorem prover.

This work achieves a fusion of three linguistic traditions for representing mathematics:  $\text{\LaTeX}$ , dependent type theory, and a long history of research into controlled natural language.

This talk will give an overview of research in computer-checked formal verification of mathematics, will present a controlled natural language for mathematics, and will discuss probable applications of this work. This project is part of the Formal Abstracts initiative, which will produce an enormous collection of mathematical definitions and theorem statements in a form that is both human and computer readable. (Received September 12, 2019)