1135-68-804   **Howard S. Cohl*** (`hcohl@nist.gov`). *Semantic Preserving Bijective Mappings of Mathematical Expressions between LaTeX and Computer Algebra Systems.*

Document preparation systems like LaTeX offer the ability to render mathematical expressions as one would write these on paper. Using LaTeX, LaTeXML, and tools generated at the National Institute of Standards (NIST) Digital Library of Mathematical Functions, semantically enhanced mathematical LaTeX markup (semantic LaTeX) is achieved by using a semantic macro set. Computer algebra systems (CAS) such as Maple and Mathematica use alternative markup to represent mathematical expressions. By taking advantage of Youssef's Part-of-Math tagger and CAS internal representations, we develop algorithms to translate mathematical expressions represented in semantic LaTeX to corresponding CAS representations and vice versa. We have also developed tools for translating the entire **Wolfram** Encoding Continued Fraction Knowledge and University of Antwerp Continued Fractions for Special Functions datasets, for use in the NIST Digital Repository of Mathematical Formulae. The overall goal of these efforts is to provide semantically enriched standard conforming MathML representations to the public for formulae in digital mathematics libraries. These representations include presentation MathML, content MathML, generic LaTeX, semantic LaTeX, and now CAS representations as well. (Received September 14, 2017)