

Custom Alternative Text For L^AT_EX Math Symbols in PDFs

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The purpose of this document is to help L^AT_EX users create accessible PDFs with screen readable mathematical expressions, specifically in scenarios with:

- (i) math symbols with problematic MathML-based alt text (as read by a screen reader, like NVDA) given the context of their usage, or
- (ii) symbols that have no MathML encoding and thus ignored by the screen reader.

Here we override MathML derived alt text using `\MathMLintent{}` that was introduced in early 2026 (however, expect many changes over 2026-2027 as the new L^AT_EX tagging functionality is rolled out).

Note: This document assumes that you are reading the PDF along side the L^AT_EX source file. You are also strongly encouraged to setup the NVDA screen reader (e.g., see <https://accessibility.huit.harvard.edu/nvda>) to hear these expressions read out loud.

Example 1: A custom “hammer-wrench” function has been implemented in this document using the symbol `\usym{1F6E0}=\⚡` from the `utfsym` package. This was done using two macros:

- `\hammerwrench = ⚡` for just the symbol (used like `\Phi = Φ`), and
- `\hammerwrenchof{x} = ⚡(x)` for a function (used like `\sqrt{x} = √x`).

These macros specify alt text for how the screen reader should read these symbols (“*hammer wrench*” and “*hammer wrench of*”, respectively). Here are example equations for each macro:

$$\sin\left(\sqrt{\⚡(x)}\right) \tag{1}$$

$$\frac{d\⚡}{dt} + \frac{d}{dt}\left[\mathbf{A} \⚡ \mathbf{A}^{-1}\right] + e^{\⚡} = 0. \tag{2}$$

If you don’t have a good (MathML capable) screen reader handy, here is how the above is read using the latest beta version of the NVDA screen reader with Adobe Acrobat:

Here are example equations for each macro. One line, with label, one. Sine of, open paren, the square root of, hammer-wrench of x, close paren. One line with label, two. The fraction with numerator d hammer-wrench and denominator dt, plus, the fraction with numerator d and denominator dt, times open bracket A hammerwrench A to the negative one power, close bracket, is equal to zero.

Important note: Unfortunately, while it’s straightforward to implement these macros to redefine the alt text for an existing math symbol (or for the function-like use of math and non-math symbols alike), *the symbol-only macro for a non-math symbol does not work!*. Why? In order for there to be MathML-based text field to modify, a base math structure must exist to get parsed by the internal `mathml-SE` tagging routine. Short of declaring a new math symbol, the crude workaround I used was overlay the new symbol on a small math symbol like `\cdot`, thereby coercing the expression to be parsed as math.

Example 2: Often, identical letters with different fonts represent distinct quantities, and this isn’t always read correctly. To illustrate overriding autogenerated MathML, this document also uses some macros that display `\Jac=\mathbf{J}` with alt text “Jacobian J”, and `\J=J` with alt text “Poisson Matrix J”. Here they are in an expression along with a standard `J` (third J):

$$\mathbf{J} \neq J \neq J.$$

Again, if you do not have a screen reader setup to read this for you, the above equation is read aloud as “Jacobian J is not equal to Poisson Matrix J is not equal to J.”