Expression Editor User Manual

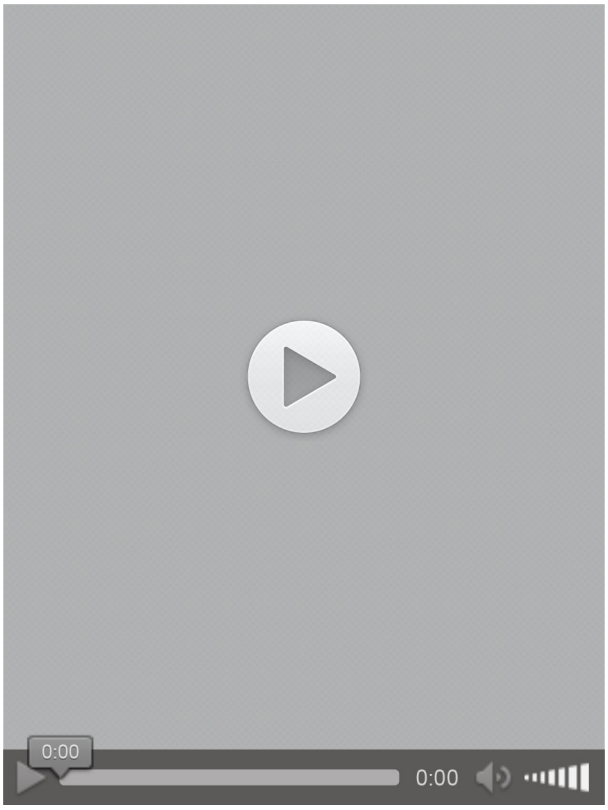


Table of Contents

List of Tables

List of Figures

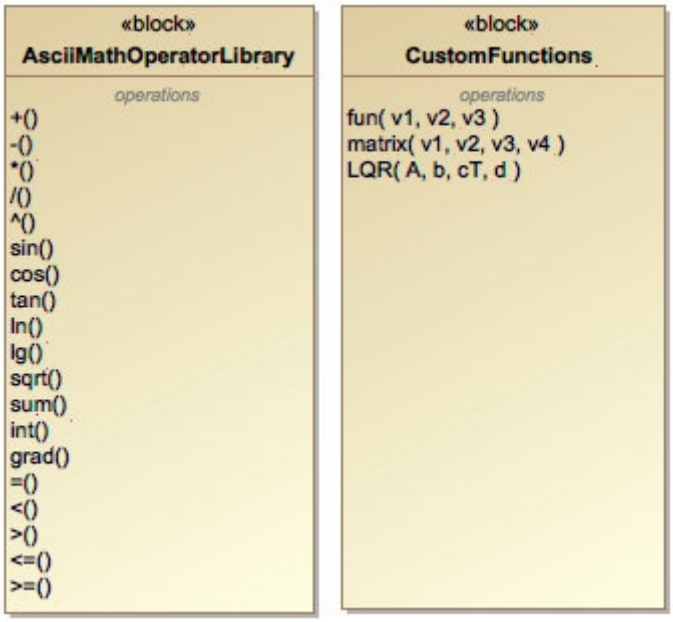
List of Equations

1 About Expression Editor

The MagicDraw Expression Editor Plugin provides the user a method to capture (constraint) expressions based on the AsciiMath library and user defined functions as UML expression in prefix or infix string notation. The Expression Editor User Manual provides documentation for how to use the plugin by defining parameters of a constraint block, adding user defined functions, defining operands and operators, and how to use existing functions.

2 Defining Operands and Operator Libraries

In order to use the expression editor the user needs to configure the MagicDraw project to provide two SysML blocks defining the available operators. The plugin requires a user defined function block, and an AsciiMath operator library block. The AsciiMath operator library block consists of predefined operations supported by the AsciMath grammar.



Example of operations in the AsciiMathOperatorLibrary and UserDefinedFunctions blocks.

3 Defining Parameters

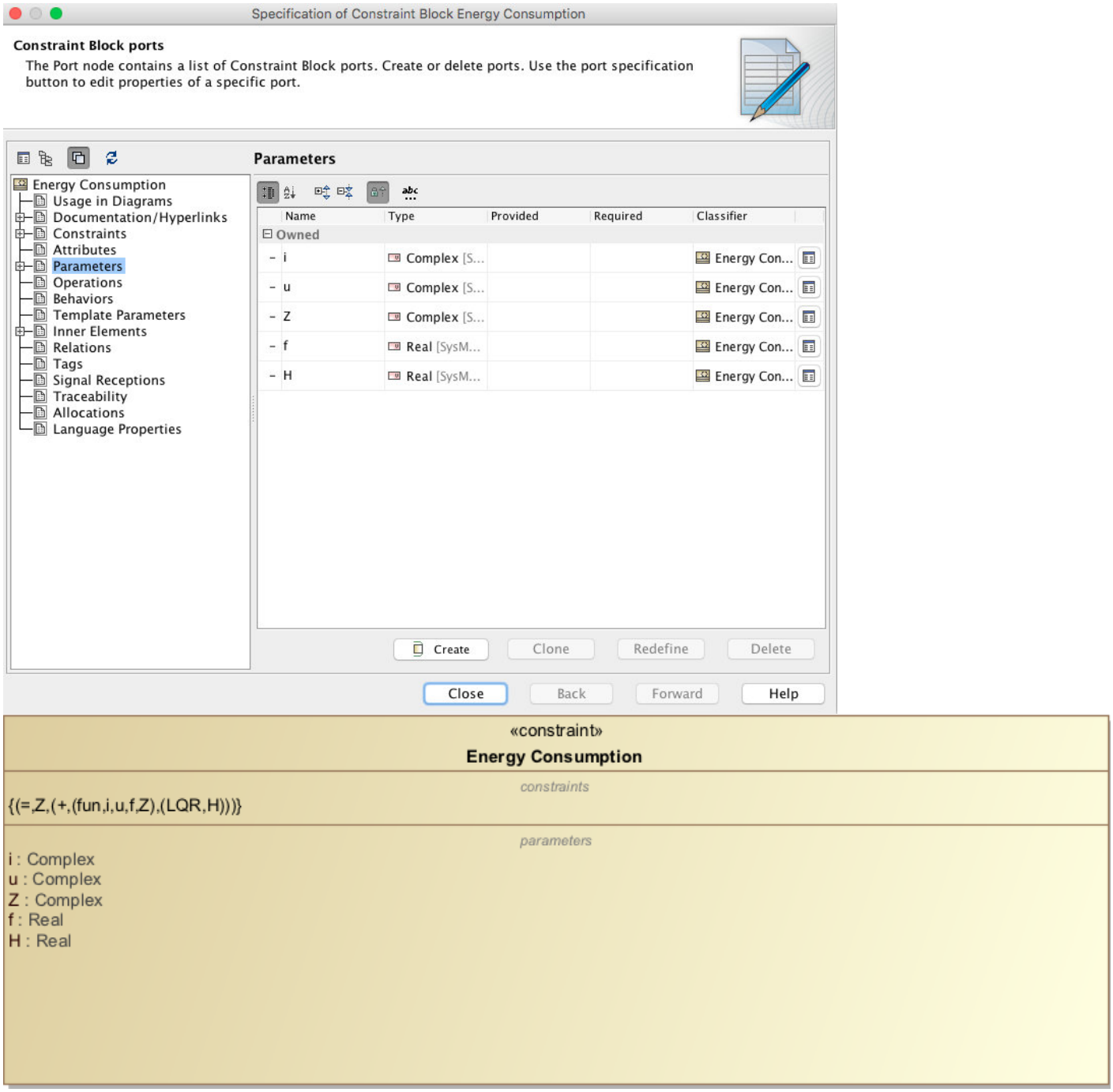
To create constraints in the constraint editor the parameters of the constraint block must be defined.

To create parameters:

1) Open the specifications of the constraint block

2) Select "Parameters" and select "Create".

3) Define the constraint blocks owned parameters names and type values.

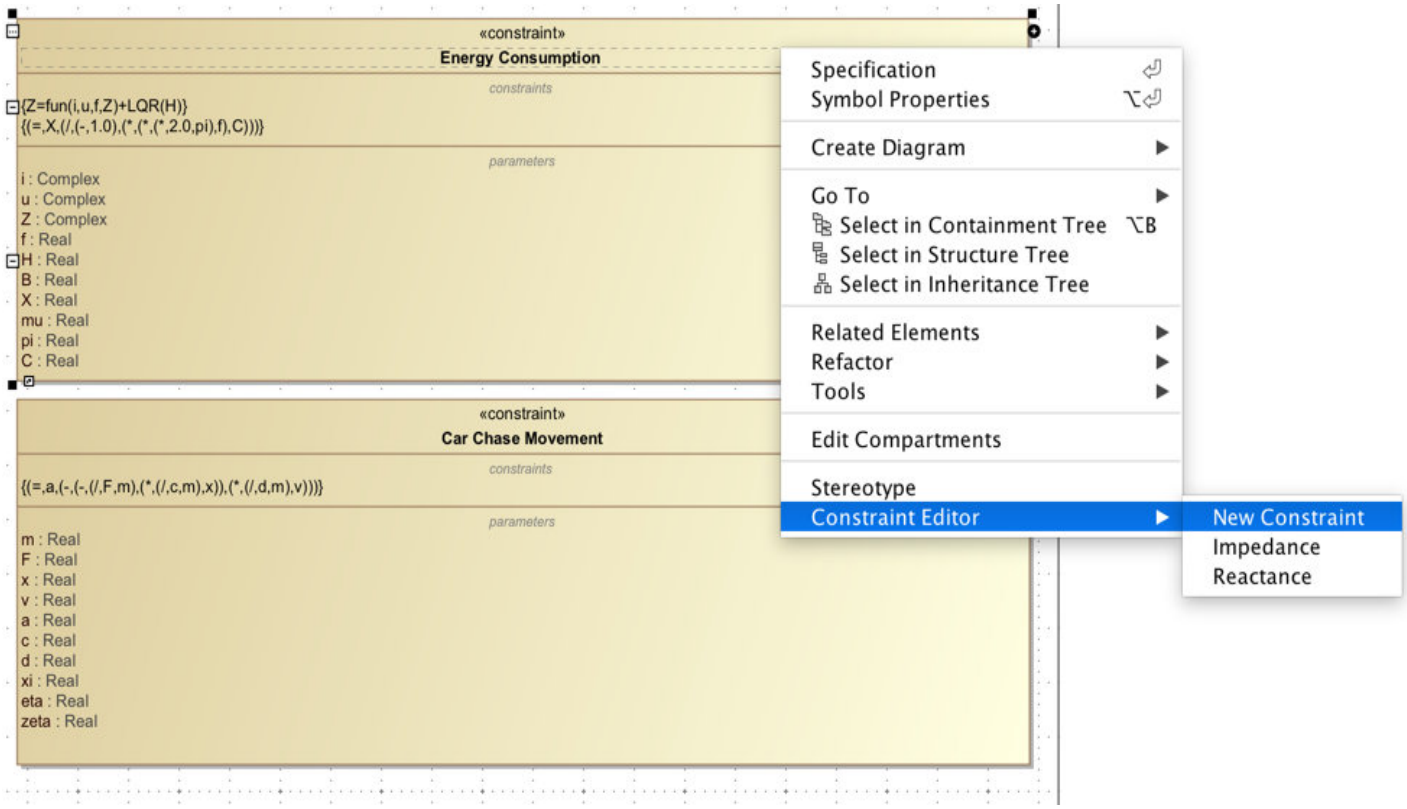


Parameters i, u, Z, f, H are defined.

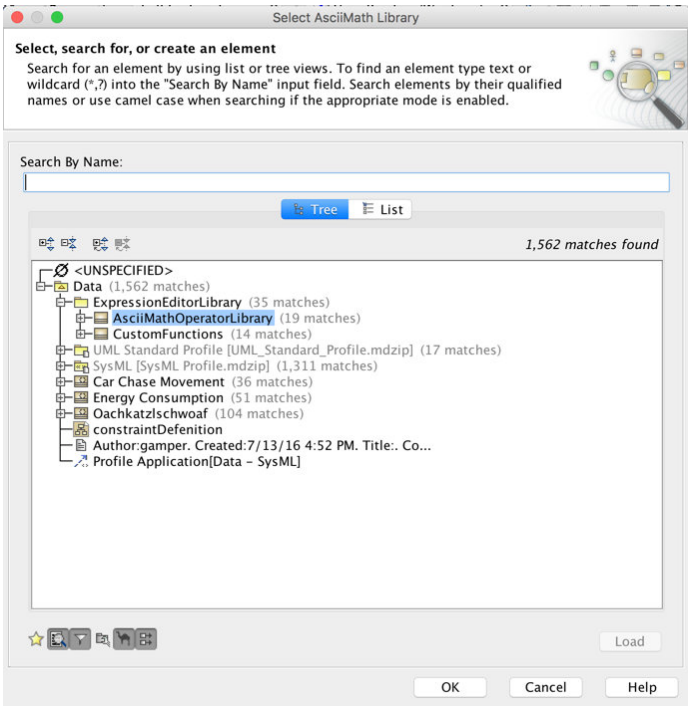
4 Adding a Constraint

1) Right click on a constraint block

2) Hover over “Constraint Editor” and select “New Constraint”.

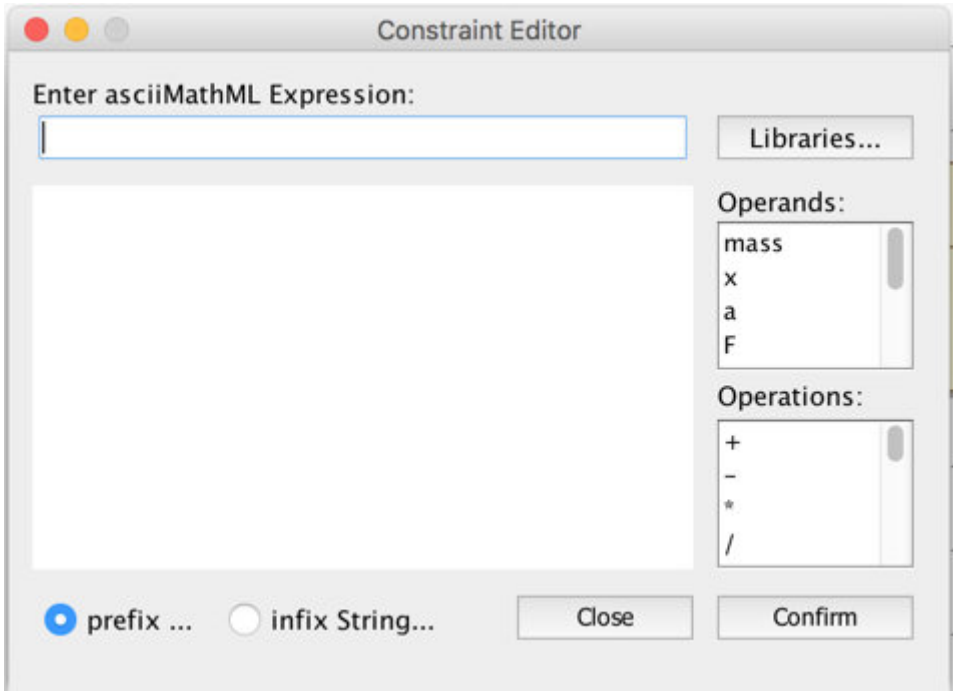


3) The first time the constraint editor is used the user has to select the libraries. In “Select AsciiMath Library” locate the appropriate block containing the AsciiMath to be used in the constraint, and select OK.

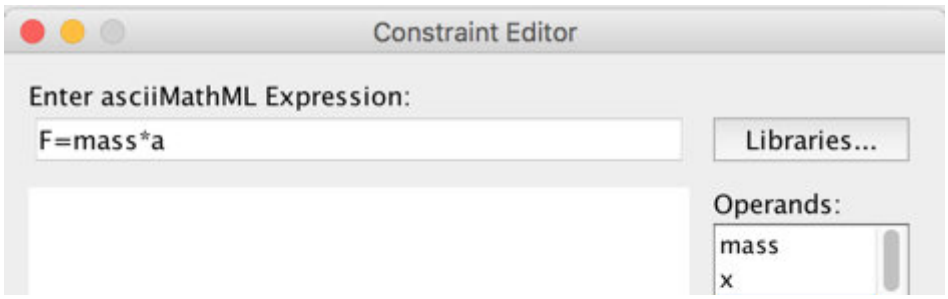


4) In “Select Customized Functions” locate the appropriate block containing the user defined functions to be used in the constraint, and select OK.

5) To enter a new constraint either type your expression into the field or double-click on the operators and operands to build your expression.



6) Select an option to parse it into a UML expression in prefix notation or in a UML string expression in infix notation.



7) Select “Confirm” and the new expression will appear as a constraint in the constraint block and in the block’s Constraint Editor menu of constraints.

Prefix Expression *Infix String Expression*

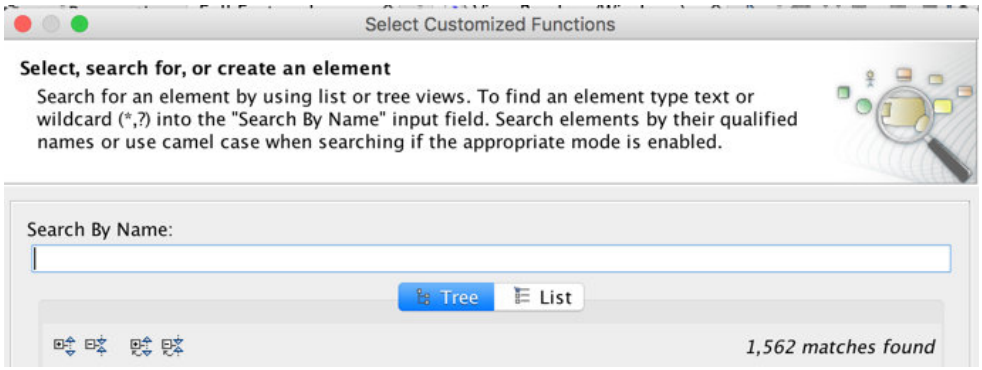
4.1 Selecting a User Defined Function Library

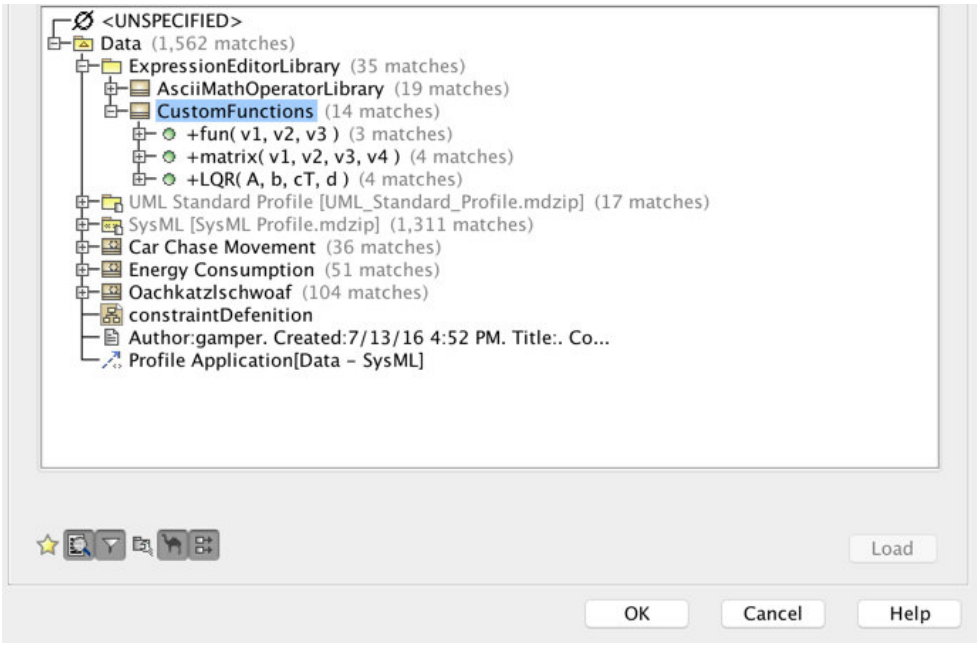
The user can change the selected library later by using the "Libraries..." button on the expression editor dialogue.

1. In “Select Customized Functions” locate the appropriate block containing the MDK expression functions.

   These custom functions define the custom operators to be used in the constraint.

2. Select OK.



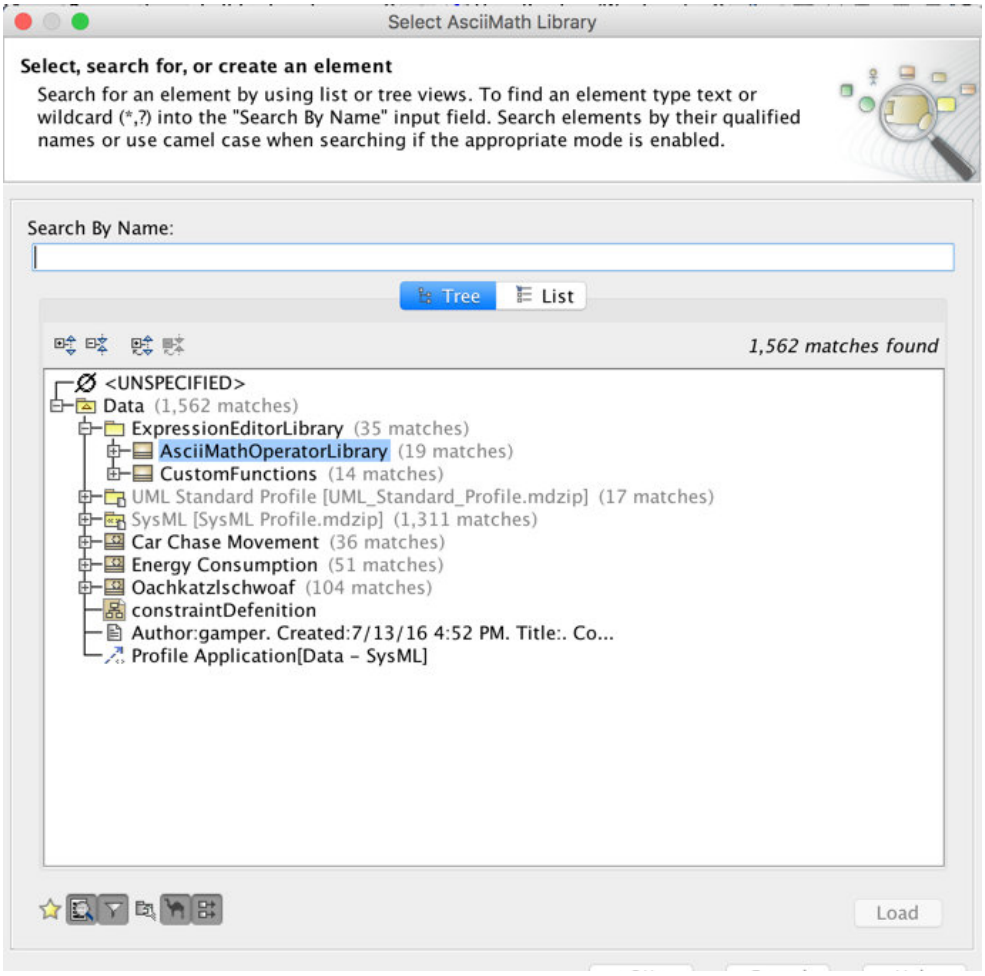


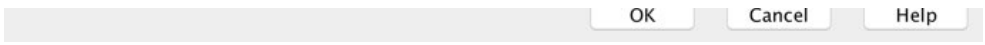
4.2 Selecting an AsciiMath Library

The user can change the selected library later by using the "Libraries..." button on the expression editor dialogue.

1) In “Select AsciiMath Library” locate the appropriate block containing the AsciiMath operator library. The operator library block contains the operators defined by the grammar.

2) Select OK.

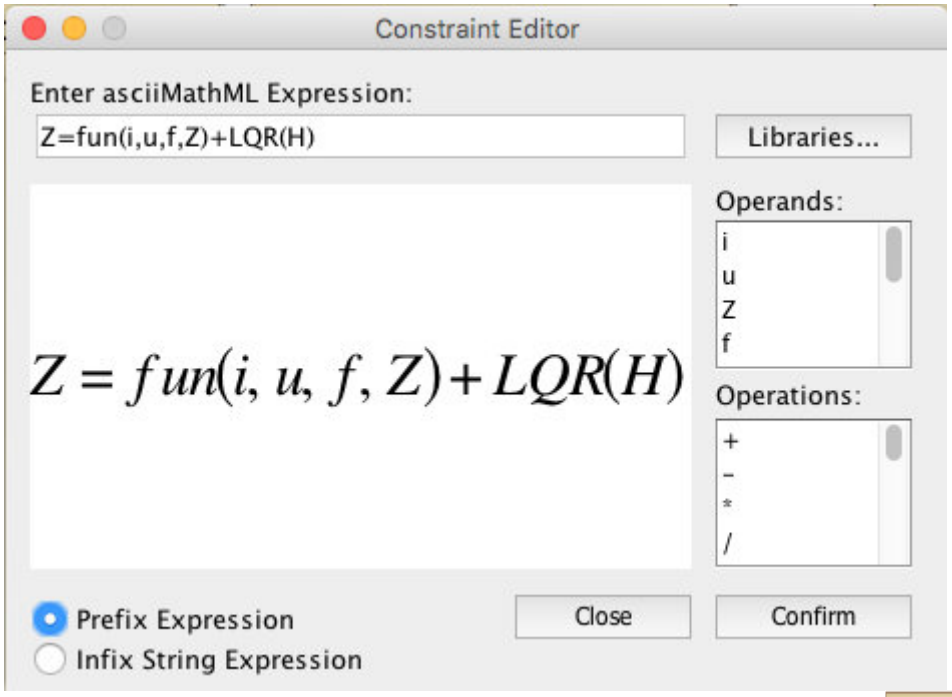


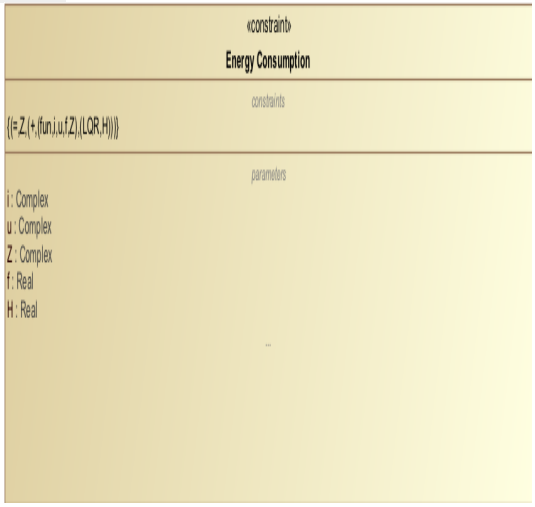

OK
Cancel
Help

5 UML Expression Notation

The user has the option to parse a constraint into UML prefix or infix string expression notation. The following constraint block example displays what the user would expect to see when selecting to parse am expression in either prefix or infix string notation.

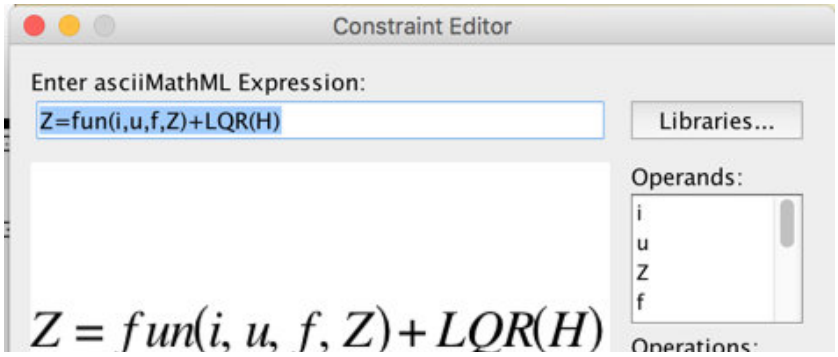
5.1 Prefix Expression

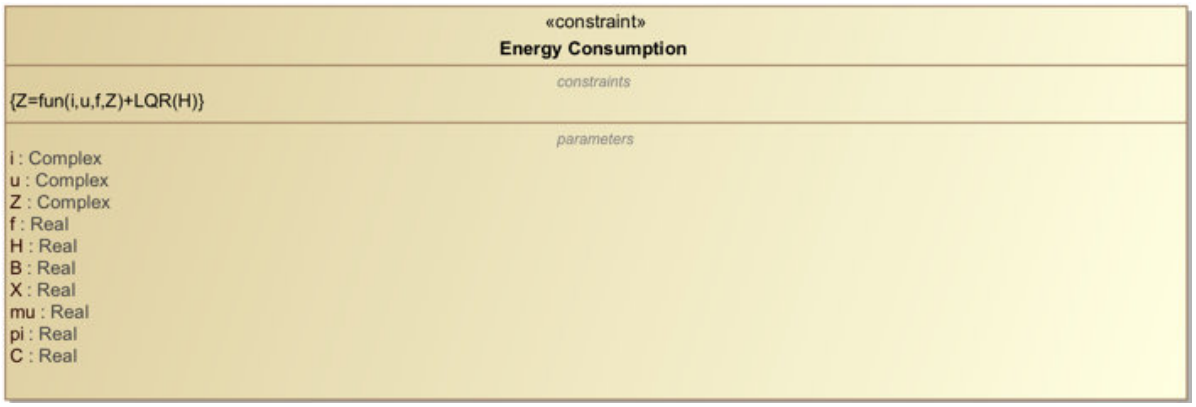




Prefix Expression Notation

5.2 Infix String Expression





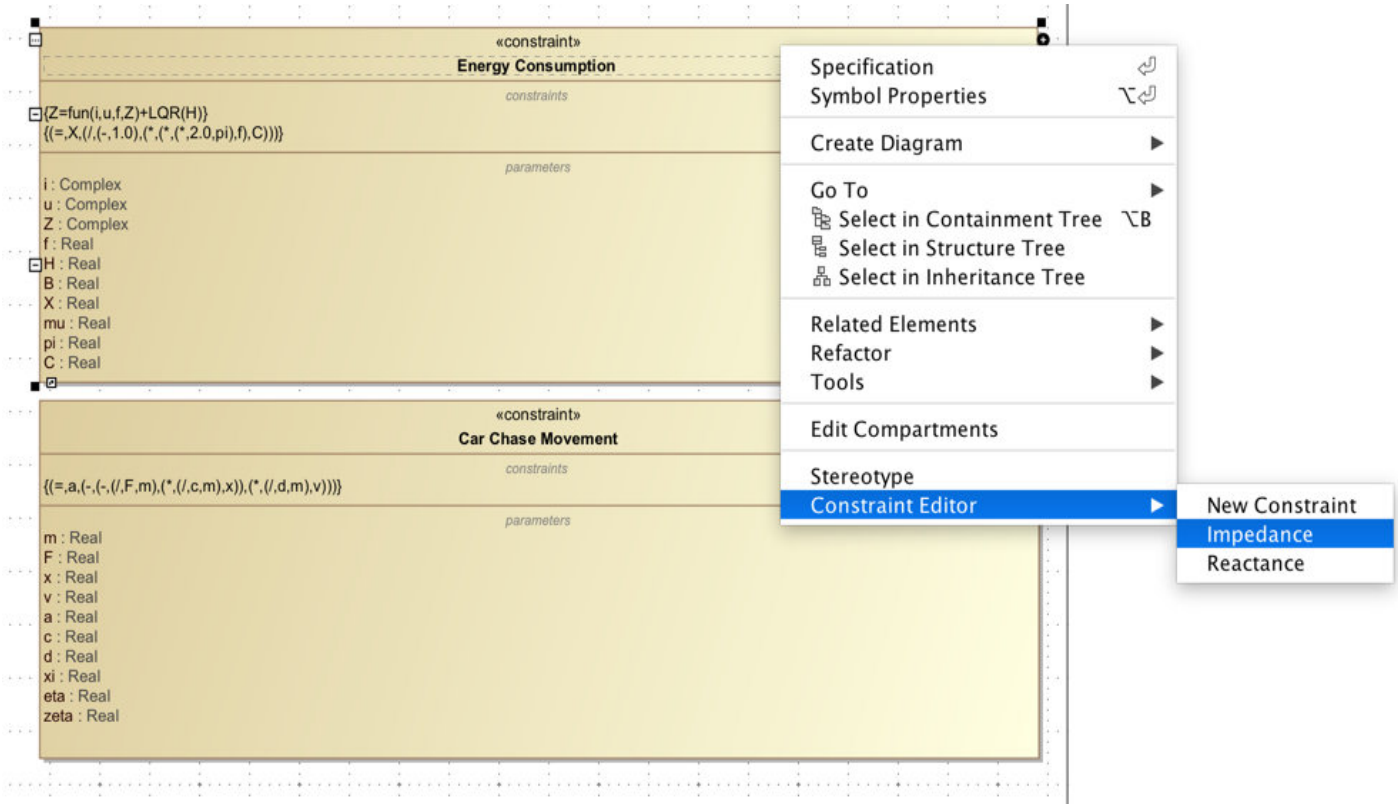
Infix String Expression Notation

6 Editing an Existing Constraint Expression

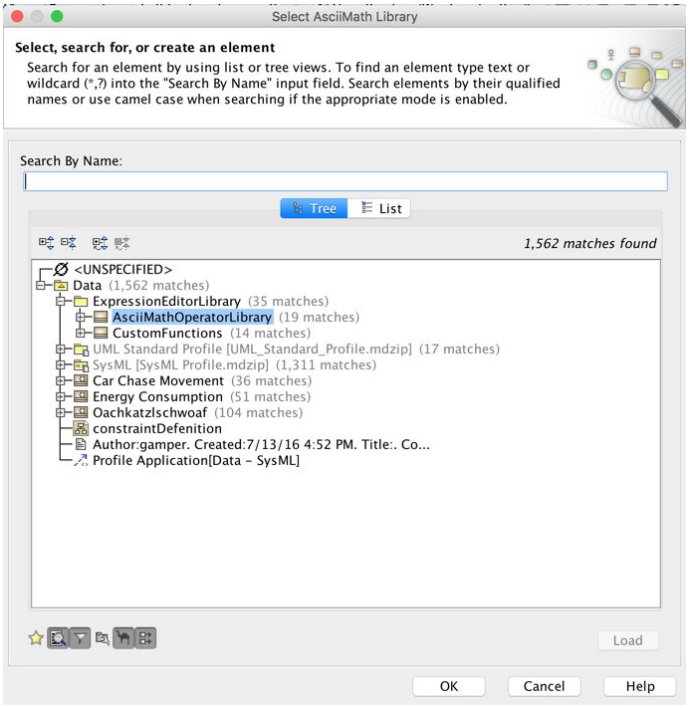
To use an existing constraint in the Constraint Editor:

1) Right click on a constraint block.

2) Right click on a constraint block, hover over “Constraint Editor”, and select the expression to be used.



3) Select your MDK expression function block and your AsciiMath operator block. Select OK.



4) In the Constraint Editor gui under “Enter asciiMathML Expression” input an AsciiMath expression that is defined by the grammar, and parse it into a prefix UML expression or in a infix UML string expression notation. Select "Confirm".

«constraint»
Energy Consumption

constraints

{Z=fun(i,u,f,Z)+LQR(H)}

parameters

i : Complex
u : Complex
Z : Complex
f : Real
H : Real
B : Real
X : Real
mu : Real
pi : Real
C : Real