

Automatic Generation of Staged Geometric Predicates

nomial expression, which is also a tedious procedure. A solution is to automate this process by using an expression compiler [2, 5]. However, to the best of our knowledge, none of the existing expression compilers

p_2 is preserved. Similar derivations produce

$$X_1 \cdot X_2 = x_1^a x_2^b S^{(2 + \max(\pm 1; \pm 2))(1 + \pm)} (p_1 \otimes p_2)$$
$$X_1 X_2 = x$$

phrases

$A ::= xjcje$

Figure 6: Passing intermediate results between phases and stages using `susp`, `lforce` and `rforce`.

tion in floating-point, and the other phases mix in elements

val $ab = a_j b$ and

where

a target floating-point expression (an expression in the syntactic

Similarly if $E(x_2^A) = 0$.

$$E \text{ } _B \text{ } \text{val } y = x_1 \text{ } E \text{ } x_2 \text{ } ; \text{ } \text{val } y^B = x_1^B \text{ } E \text{ } x_2^B \text{ } ; \\ \text{approx}(y^B) ; \left. \frac{1+\epsilon}{1-\epsilon} \text{err}_E^B(\pm_1; \pm_2) \right]_{fp} - y^P / \\ E; y^B : O_B(\text{err}_E^B(\pm_1; \pm_2))$$

A.3 Third phase

The judgment for phase C is $E_1 \text{ } _B \text{ } @ ; \dots ; r_1; r_2 / E_2$. The expression r_2 is now just one summand in the bound on the absolute error. See the definition of the judgment $_P$