In this work, we use F-SEFI to conduct a fault injection campaign study on our microbenchmark, an algorithmic-based fault tolerant matrix multiplication code. Results from the analytical model when a and b are chosen such that overflow will not occur in a*b. Note the relatively high percentage of multiplicative resilience when the bit length of the factors is smaller compared to the architectural width.

Results from the experimental verification of selective injection for 32-bit a * b space. Testing every possible bitflip on a or b as specified, for integer multiplication, division and modulo. Note the relatively high percentage of resilience across each of these operations.

Future Work

We have recently developed the initial framework for theoretically modeling resilience as it pertains to integer division. We intend to complete this work, and extend it to other integer operations, such as modulo, in order to contrast the predicted behavior with the observed behavior in some of our recent experimental studies.