

Comparison of latest results

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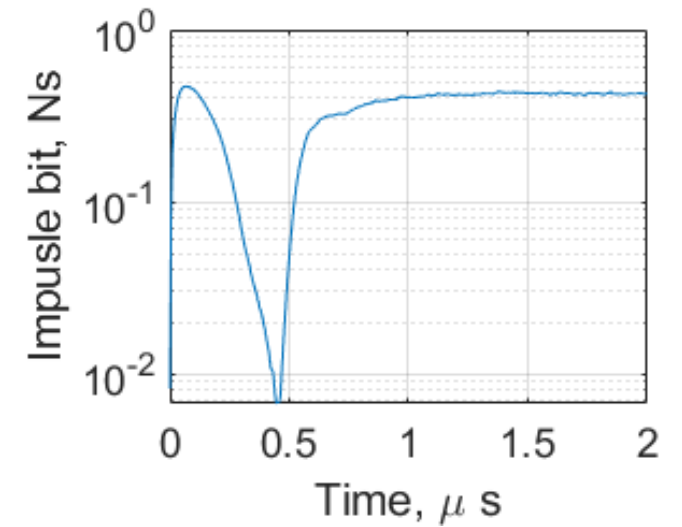
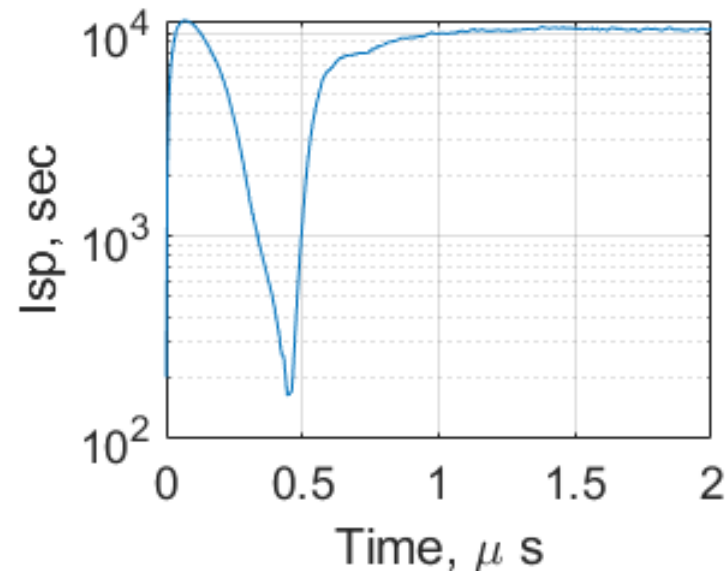
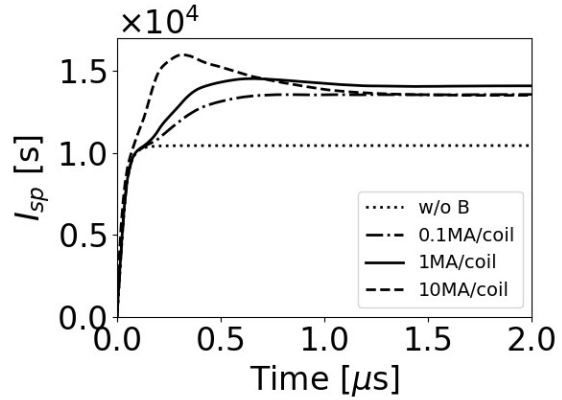
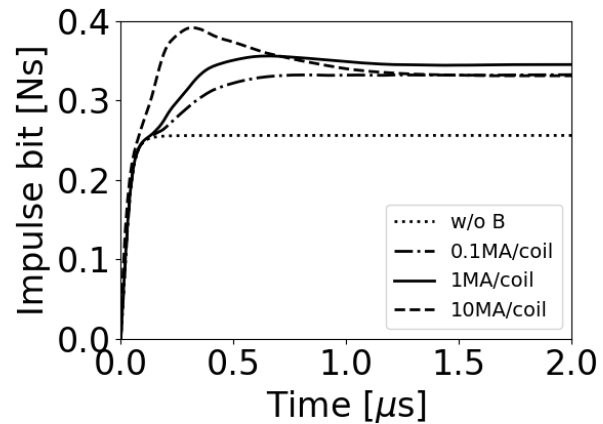
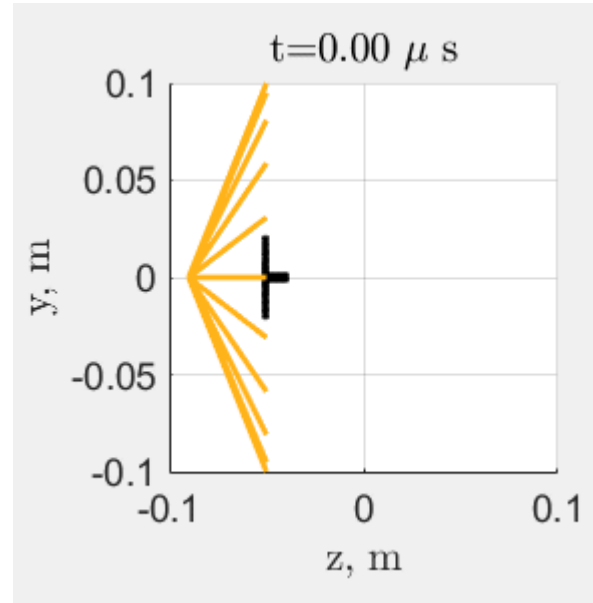
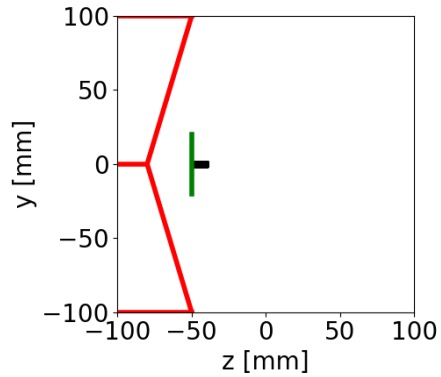
Inputs

- Same input file from your 2018 JBIS paper
 - Adjusted how coils are input in the code to conform to our new way of doing things
 - 20 coils, 10 MA each
 - Each coil 0.1 m in radius and 0.04 m in height (z)
 - Placed at $z = -0.09$ m
 - Cylindrical fusion plasma
 - Equal mixture of D&T
 - 1mm radius, 10 mm height
 - 1 keV initial temperature, 2.5 mg initial mass
 - Pusher Plate
 - 20 mm height, 0.333 mm in width
 - When encountering plate, particle's z-velocity is flipped (multiplied by -1)
 - Initially tried a particle resolution of 1,000 particles but had to upgrade it to 10,000 for convergence

Comparison of Results (10 MA case)

JP results (Oct. 21, 2021)

SPFMax results



Comparison of Results (cont.)

- Different plasma behavior than JP or previous simulations
 - Plasma begins to exit the nozzle but is pushed back into the nozzle
 - Recirculates near the nozzle apex/pusher plate, going around the pusher plate
 - Some plasma is forced against the pusher plate
- Performance is very different from expected
 - Peak performance matches somewhat well
 - 0.4 Ns vs. 0.4 Ns
 - 15,000 sec vs. 10,000 sec
 - Performance rapidly decreases, then increases again
 - Performance seems to oscillate after that
 - Different behavior than JP results
- Solver might be putting too much energy into magnetic field