Contribution ID: **1226** Type: **Poster**

4P40 - Elements of Three Dimensional Modeling of a Pulsed Fission Fusion Hybrid Z-Pinch Target for Advanced Propulsion

Thursday 27 June 2019 16:00 (1h 30m)

The Pulsed Fission-Fusion Engine (PuFF) propulsion concept combines utilizes targets of fission and fusion fuel layers compressed and heated by a pulsed z-pinch driver. Fusion may provide the neutron seed to ignite the fission fuel, which in turn provides fission fragment heating to sustain the fusion reactions. The propulsion system utilizes a z-pinch to compress PUFF targets. Thermal expansion of the fission/fusion fuel and inert propellant against a magnetic nozzle produces thrust. The concept is expected to have a thrust range of of 0.5 to 10 kN and specific impulse from 10000 to 30,000 s. In this talk, modeling efforts supporting PuFF will be discussed, with emphasis placed on 3D modeling. We will present some notional implosion modeling of high Z materials in cylindrical geometries and rapid expansion against pulsed magnetic nozzles.

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Session Classification: Poster - Charged Particle Beams and Accelerators and High Energy Density Plasmas and Applications

Track Classification: 4.1 Fusion (Inertial, Magnetic and Alternate Concepts)