

Abstract Submitted
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LAPS discretization and solution of plasma dynamics¹ LAURA SCARABOSIO, GIAN LUCA DELZANNO, ZEHUA GUO, BHUVANA SRINIVASAN, XIANZHU TANG, LANL — LAPS provides spectral volume discretization for evolving plasma dynamics described by conservative partial differential equations. Our initial focus is on its implementation for one dimensional spherical and two dimensional cylindrical plasma implosion for inertial confinement fusion (ICF) applications. LAPS primarily targets spectral methods which include spectral volume/element/difference. The spectral volume formulation is particularly attractive for ICF for its explicit local conservation properties and the spectral convergence of the solution. It is also advantageous for plasma transport in magnetic fusion in which cell-wise conservation improves the physics fidelity. Care has been taken to separate the grid generation, spectral volume discretization, and time stepping scheme for the time-dependent two-fluids plasma equations, so the LAPS infrastructure can be easily used for different applications such as tokamak scrape-off layer modeling.

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