1024-65-230 **Bobby Philip*** (bphilip@lanl.gov), T-7, Mathematical Modelling and Analysis, Theoretical Division, MS B284, Los Alamos National Laboratory, PO Box 1663, Los Alamos, NM 87545, and **Michael Pernice** and **Luis Chacon**. *Implicit Adaptive Mesh Refinement for Reduced Resistive Magnetohydrodynamics.*

Implicit adaptive mesh refinement (AMR) for resistive magnetohydrodynamics is described. Solving this challenging multi-scale, multi-physics problem can improve understanding of reconnection in magnetically-confined plasmas. AMR is employed to resolve extremely thin current sheets, essential for an accurate macroscopic description. Implicit time stepping is used to accurately follow the dynamical time scale of the developing magnetic field, without being restricted by fast Alfven time scales. At each time step, the large-scale system of nonlinear equations is solved by a Jacobian-free Newton-Krylov method together with a physics-based preconditioner. Each block within the preconditioner is solved optimally using the Fast Adaptive Composite grid method, which is a multiplicative Schwarz method on AMR grids. Initial results on the application of implicit AMR to a reduced resistive MHD model are presented.

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