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☐ Theory ☐ Experiment

Methodology and Application of GCNM to Tokamak Transport,* H.E. St. John, L.L. Lao, GA, M. Murakami, ORNL – The Predictive Transp project was recently approved and funded. The General Atomics contribution to this project is the development of a set of core solution methods that will be used to solve the typically very stiff diffusion equations that are encountered in recent theoretical models of particle, momentum and energy confinement. Here we describe the progress in this work, the special methods required to overcome numerical difficulties such as adaptive grids, changing support sets and dynamic dependent variable selection methods. A combination of steepest descent, Newton and trust region strategies and evaluation of Jacobians using algorithmic differentiation in conjunction with OpenMp and MPI parallel methods will also be incorporated. Applications to ITER time dependent and steady state AT discharges with fast wave, neutral beam and ECH current drive are presented.

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☐ Oral ☒ Poster