Adaptive Timestepping Schemes for Plasma Systems ANDREW HO, URI SHUMLAK, University of Washington — Many techniques for modeling complex plasma systems are difficult to properly characterize mathematically. This has implications for modeling these systems numerically as choosing a suitable timestep is important for balancing computational costs and stability/accuracy of the numerical model. This research investigates methods for characterizing the stability of the ideal two-fluid plasma model, and highlights a few challenges associated with mixed hyperbolic-reaction systems of PDE's. Control systems which can balance the stability requirements and accuracy of the method are presented. These techniques are then applied to investigate the behavior of a mixed potential formulation of Maxwell's equations coupled with the two fluid plasma model.

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