

# STRUCTURE-PRESERVING FINITE-ELEMENT SCHEMES FOR COUPLED EULER-POISSON AND EULER-MAXWELL SYSTEMS

MATTHIAS MAIER, JORDAN HOFFART, AND IGNACIO TOMAS

ABSTRACT. We discuss structure-preserving numerical discretizations for the Euler-Poisson and Euler-Maxwell systems. The schemes are fully discrete and structure preserving in the sense that they maintain a discrete energy law, as well as hyperbolic invariant domain properties, such as positivity of the density and a minimum principle of the specific entropy.

We discuss the underlying algebraic discretization technique based on collocation and convex limiting that maintain hyperbolic invariants and a discrete energy law, and discuss recovery strategies to maintain the discrete Gauss law. **Keywords:**

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DEPARTMENT OF MATHEMATICS, TEXAS A&M UNIVERSITY, COLLEGE STATION 77843 TX, USA  
*Email address:* `maier@tamu.edu`

DEPARTMENT OF MATHEMATICS, TEXAS A&M UNIVERSITY, COLLEGE STATION 77843 TX, USA  
*Email address:* `jordanhoffart@tamu.edu`

DEPARTMENT OF MATHEMATICS & STATISTICS, TEXAS TECH UNIVERSITY, 2500 BROADWAY LUBBOCK 79409 TX, USA  
*Email address:* `igtomas@ttu.edu`