

Abstract Submitted
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Implementation of higher-order moment equations in NIMROD¹

JEONG-YOUNG JI, E.D. HELD, Utah State University, C.R. SOVINEC, University of Wisconsin-Madison — A general formulation of higher-order moment equations² is being incorporated into the NIMROD fluid code in conjunction with PSI-Center activities. As an initial implementation, evolution equations for heat flow, heat-weighted heat flow, stress, and heat stress (21 moments) for electrons and ions have been adjoined to NIMROD's existing two-fluid model. Consistent with NIMROD's time staggering scheme, vector moments are centered with the plasma flow advance and rank-2 tensor moments are centered with the plasma density and species temperatures. Results from simulations involving simple wave phenomena are discussed. Although at present brute force truncation is applied, future plans include implementing more rigorous closures for the 21 moment model.

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²J.-Y. Ji and E. D. Held, Phys. Plasmas 15, 102101 (2008).

Jeong-Young Ji
Utah State University

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