

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Plasma Model V&V of Collisionless Electrostatic Shock ROBERT MARTIN, HAI LE, ERC Inc., DAVID BILYEU, NRC Research Associate, STEPHEN GILDEA, AFRL/RQRS — A simple 1D electrostatic collisionless shock was selected as an initial validation and verification test case for a new plasma modeling framework under development at the Air Force Research Laboratory's In-Space Propulsion branch (AFRL/RQRS). Cross verification between PIC, Vlasov, and Fluid plasma models within the framework along with expected theoretical results will be shown. The non-equilibrium velocity distributions (VDF) captured by PIC and Vlasov will be compared to each other and the assumed VDF of the fluid model at selected points. Validation against experimental data from the University of California, Los Angeles double-plasma device¹ will also be presented along with current work in progress at AFRL/RQRS towards reproducing the experimental results using higher fidelity diagnostics to help elucidate differences between model results and between the models and original experiment.

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¹R.J. Taylor, D.R. Baker, H. Ikezi, **PRL** 24:5, 206-209, 1969.

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Date submitted: 11 Jul 2014

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