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Kinetic Modifications to the Ion Threat Spectra on IFE Reactor First Walls[1] JOHN F. SANTARIUS, GREGORY A. MOSES, University of Wisconsin — Most ion threat spectra calculations for inertial fusion energy reactor first walls use a radiation hydrodynamics model based on the fluid approximation. During the post-burn expansion, however, ion collisional mean free paths can become significantly larger than the shock thickness, limiting the maximum energy transfer. We focus on the high average power laser (HAPL) fusion reactor [J.D. Sethian, et al., *Nuclear Fusion* **43**, 1693 (2003)]. The University of Wisconsin's 1-D radiation hydrodynamics code, BUCKY, predicts that, at 34.592 ns, the primary shock wave occurs in the zones at the CHDT interface just outside of the pure DT zones, and another shock occurs at the interface where the plastic impacts the gold. The dense core inside r$\sim$10 μm remains well described by hydrodynamics. The mean free path in the primary shock's frame for slowing down of CH ions on the shock DT ions and electrons approximately equals the shock thickness. The shock thickness where the CH ions impact the Au ions is nearly 1000 times smaller than the mean free path. Results of addressing the problem by implementing energy deposition for moderate-to-large mean free paths using zone-by-zone differential masses and velocities in the BUCKY code will be reported.

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