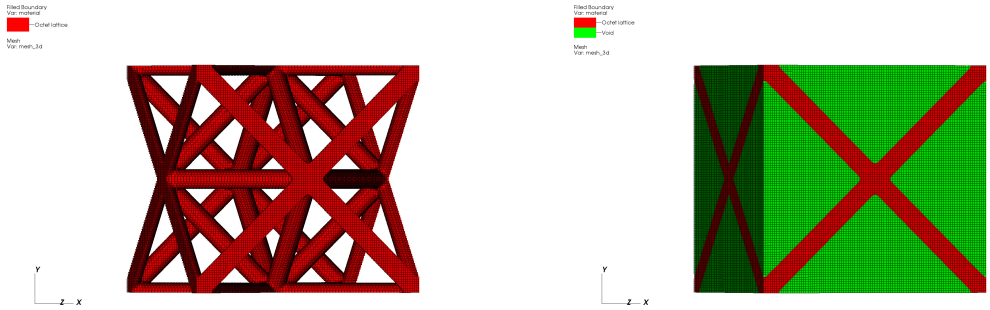
Supplemental material

Quantity	Description	Value
E	Young's modulus	1900 MPa
ν	Poisson's ratio	0.35
σ_y	Yield stress	40 MPa
ρ	Material density	1.181 g/cm^3

Table SI: Material properties of the HDDA lattice for the FE simulations.



(a) (b)

Figure S1: Example of the mesh of an octet truss single unit cell used in the simulations. The Octet truss unit cell size is 250μm×250μm×250μm. The hexahedral mesh elements are 2.5μm×2.5μm×2.5μm. For each unit cell, the total number of elements is 10^6. The relative density of the octet truss is 10%, and therefore its representation required 10^5 mesh elements per unit cell. (a) shows the mesh for the octet truss unit cell only. (b) shows the entire mesh for the void space and octet truss unit cell. <<color only >>

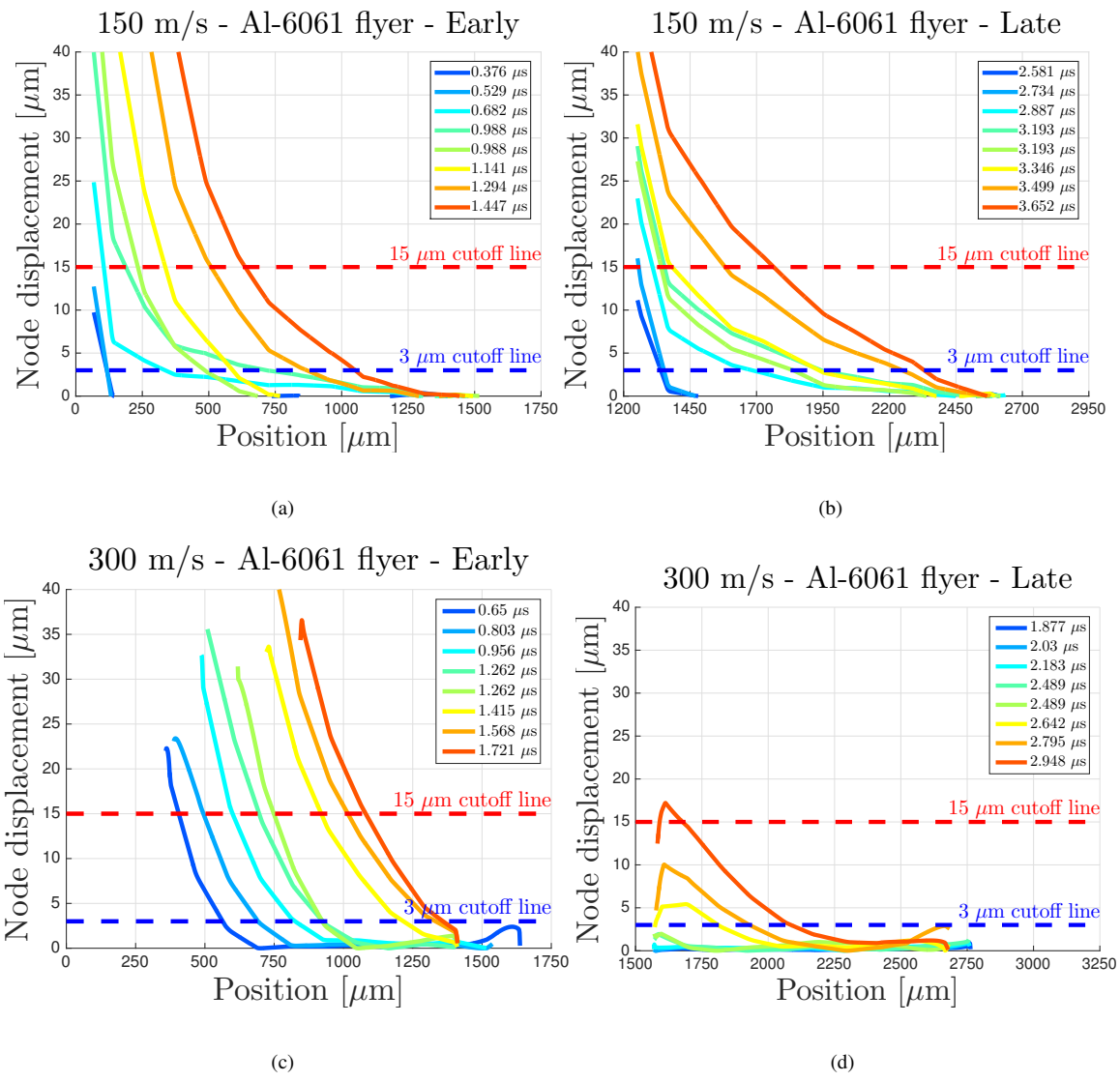


Figure S2: Displacement profiles depicting the average nodal displacement as function of lab position along the sample for Experiment #3 in (a), Experiment #4 in (b), Experiment #5 in (c), and Experiment #6 in (d). Dashed lines represent an estimate of the wavefront based off of a 3μm movement of nodes. Curves are color coded by the experimental observation time. <<color only >>

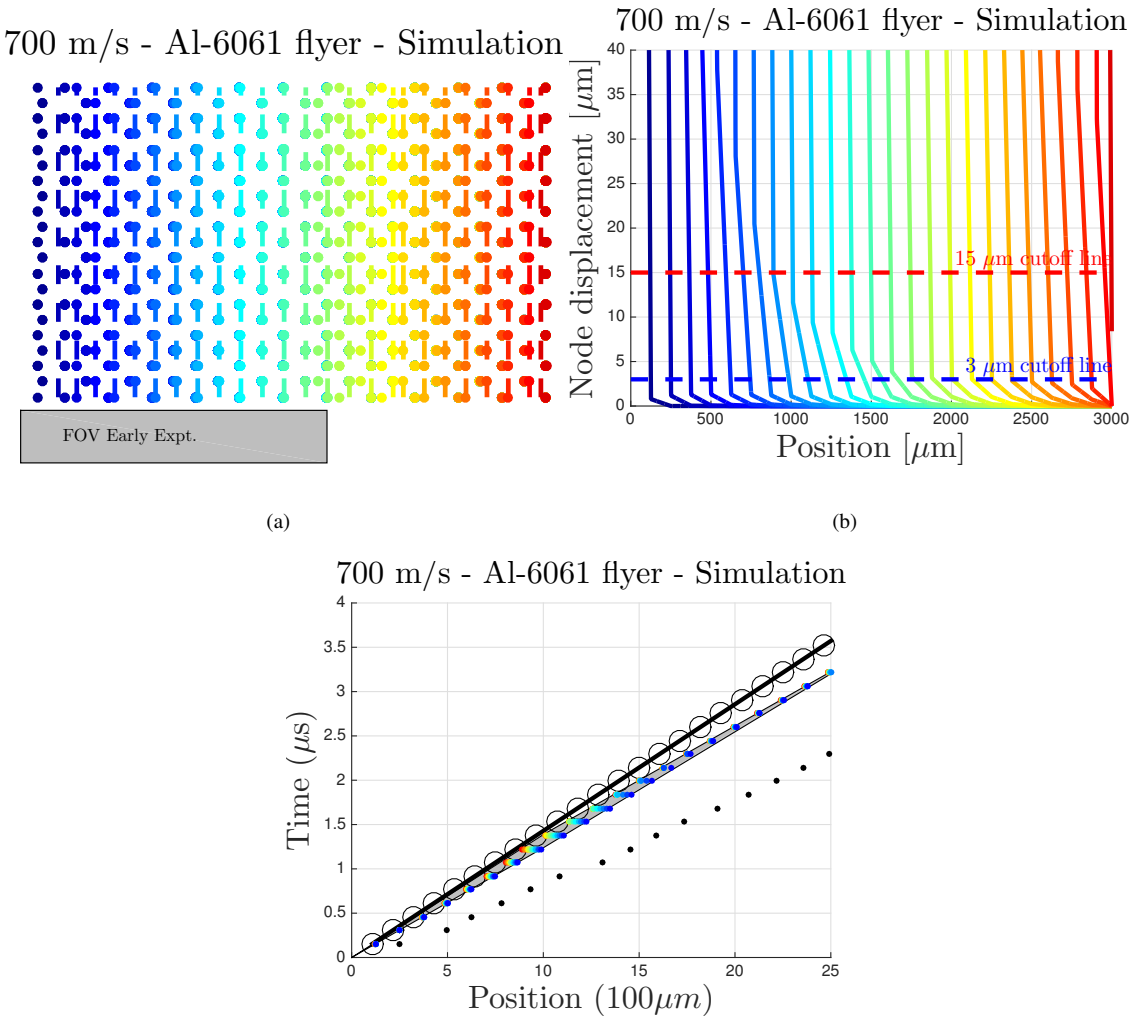


Figure S3: Node trajectory (a), displacement profiles (b), and x-t diagrams for the highest impact speed simulation, Simulation #5, which directly corresponds to Experiment #9. <<color only >>