2019 Generic Large Automated Driving System (ADS) Vehicle

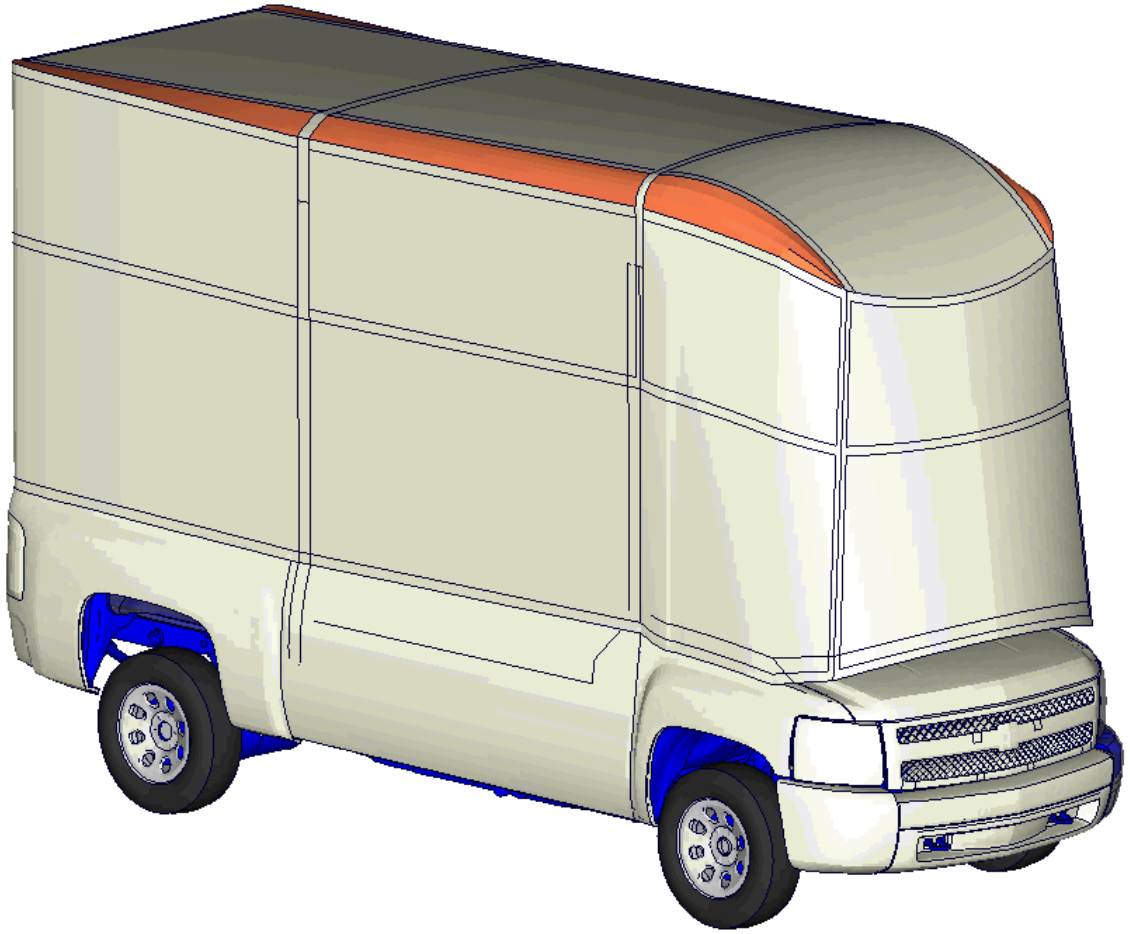
Finite Element Model Development

DOI: 10.13021/xq4b-vj11

Vehicle Description

- GMU-CCSA-GENERIC-Large-ADS-VEHICLE-V1.key
- Large Automated Driving System (ADS) Vehicle
- Weight: 4172 kg
- Finite element model derived from a validated 2014 Chevrolet Silverado FE model (doi:10.13021/p6mn-hp79)
- Dimensions similar to existing large ADS vehicle concepts
- Resulting large ADS vehicle FE model was NOT validated against test data

Model Information

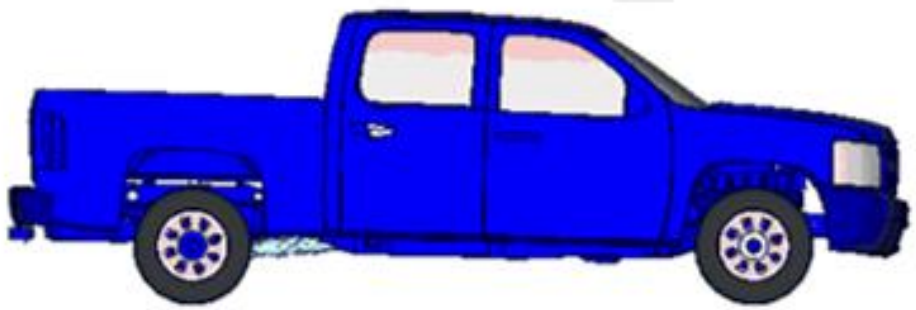


Number of parts	414
Number of nodes	311987
Number of solid elements	4899
Number of shell elements	301752
Number of beam elements	1515
Number of elements	308166
Model units	mm, s, t, N
Release date	Nov. 2019

Example of an existing large ADS vehicle concept

www.enride.tech

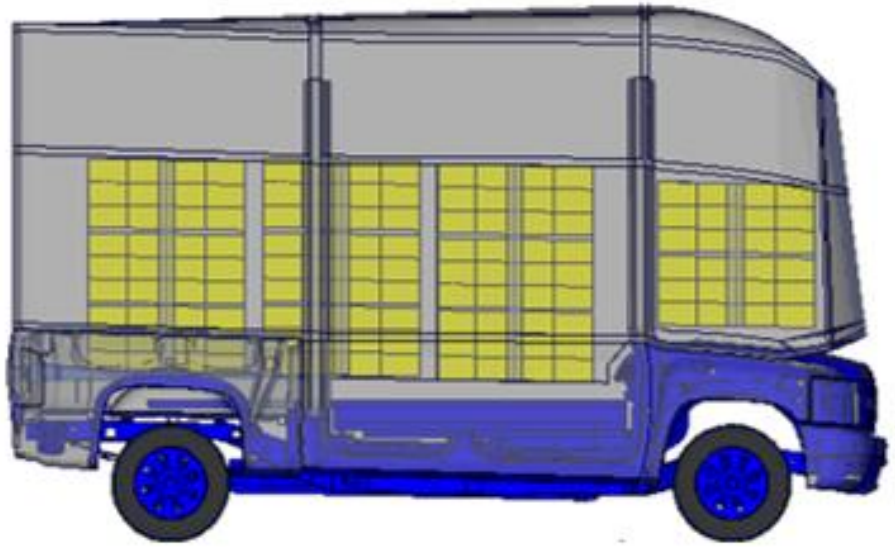
Model Development



Existing FE Model

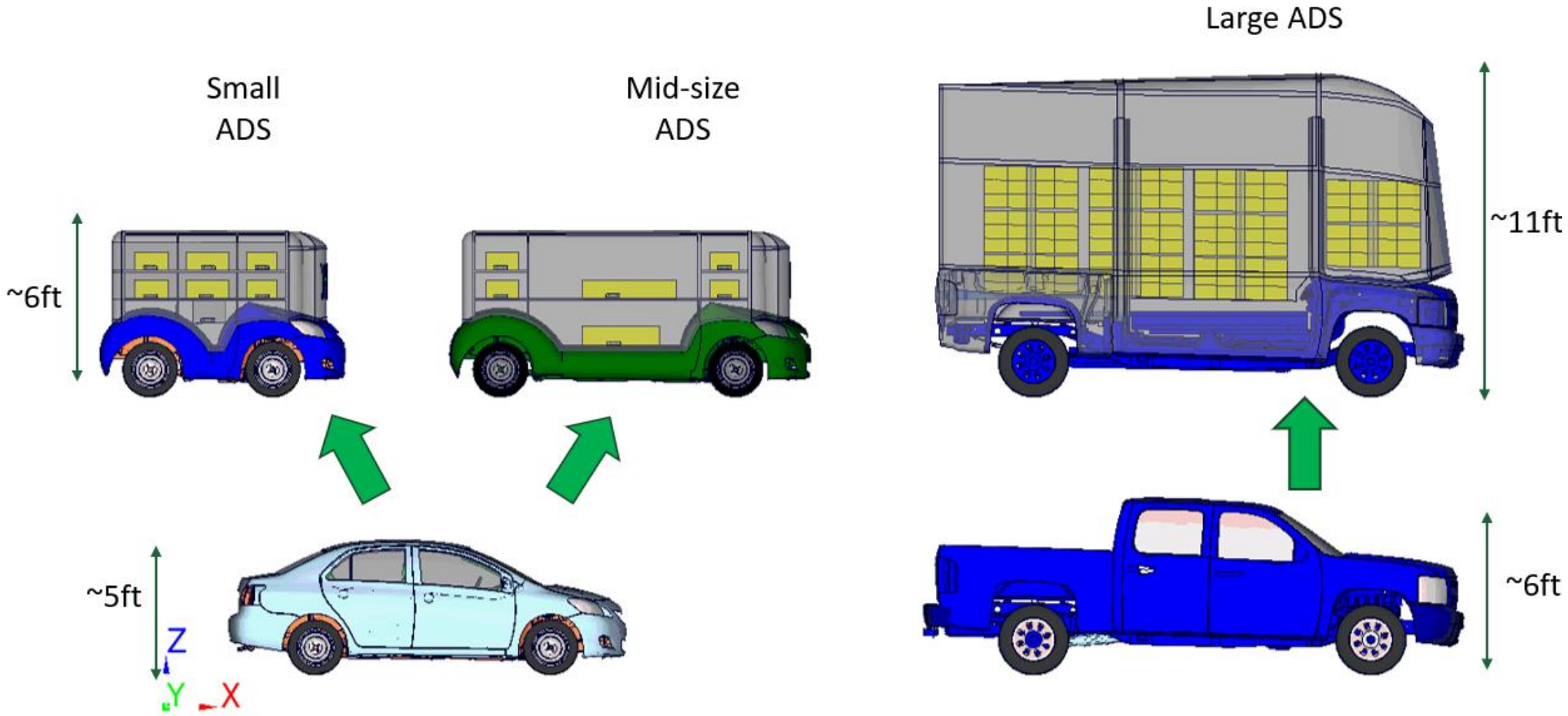
Remove engine, cabin, and bed

Add battery, motor, ADS body, and cargo

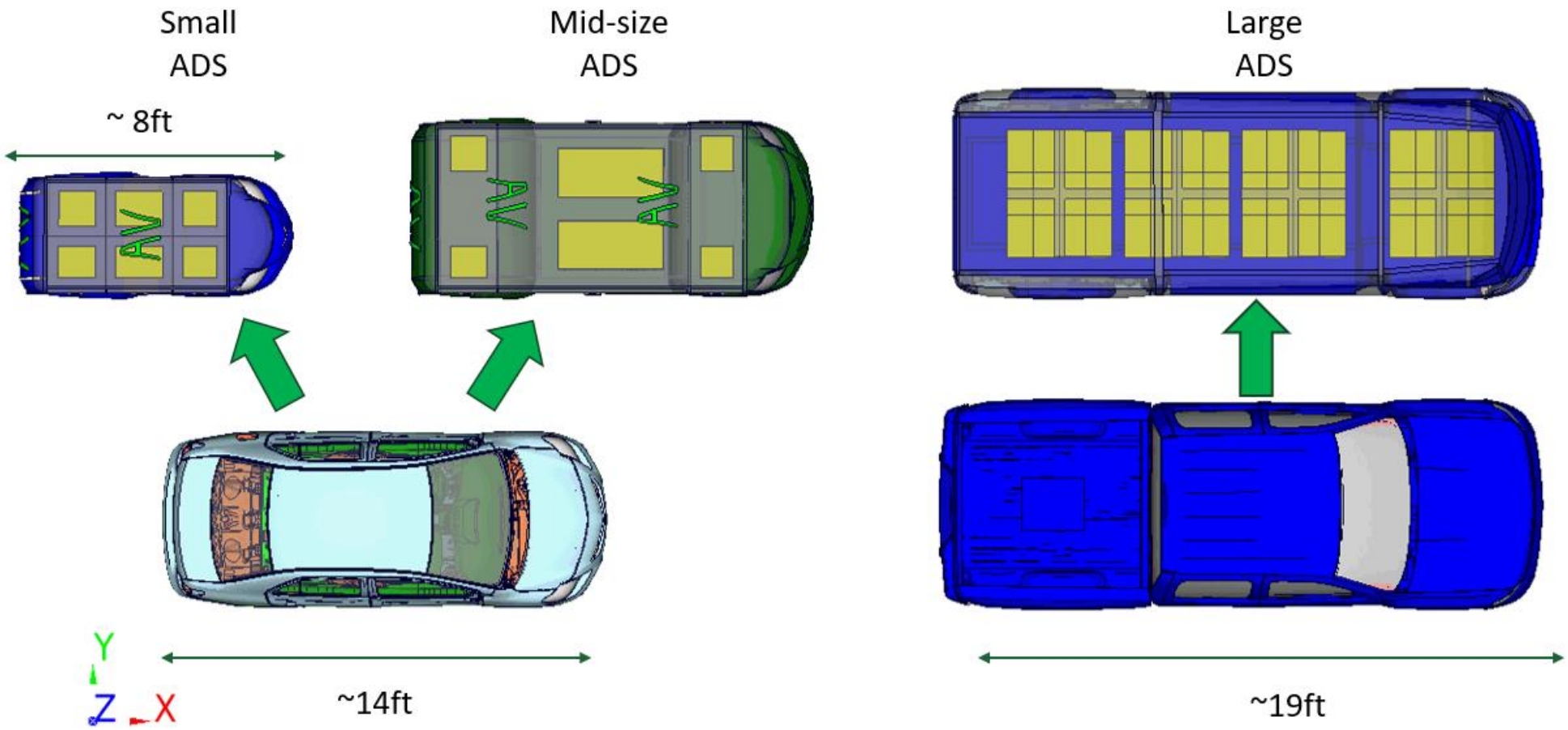


Generic Large ADS FE Model

Model Dimensions – Side View

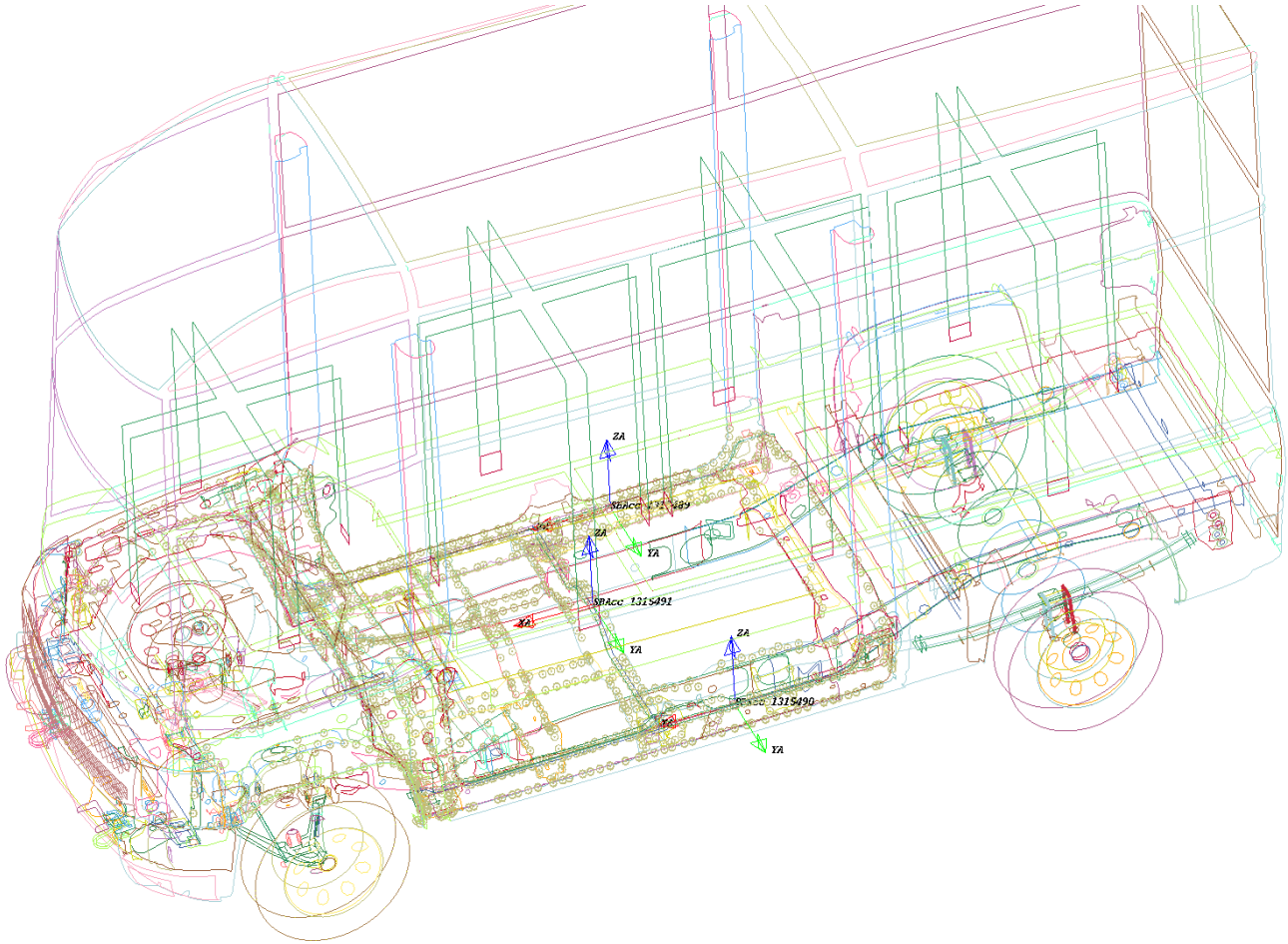


Model Dimensions – Top View

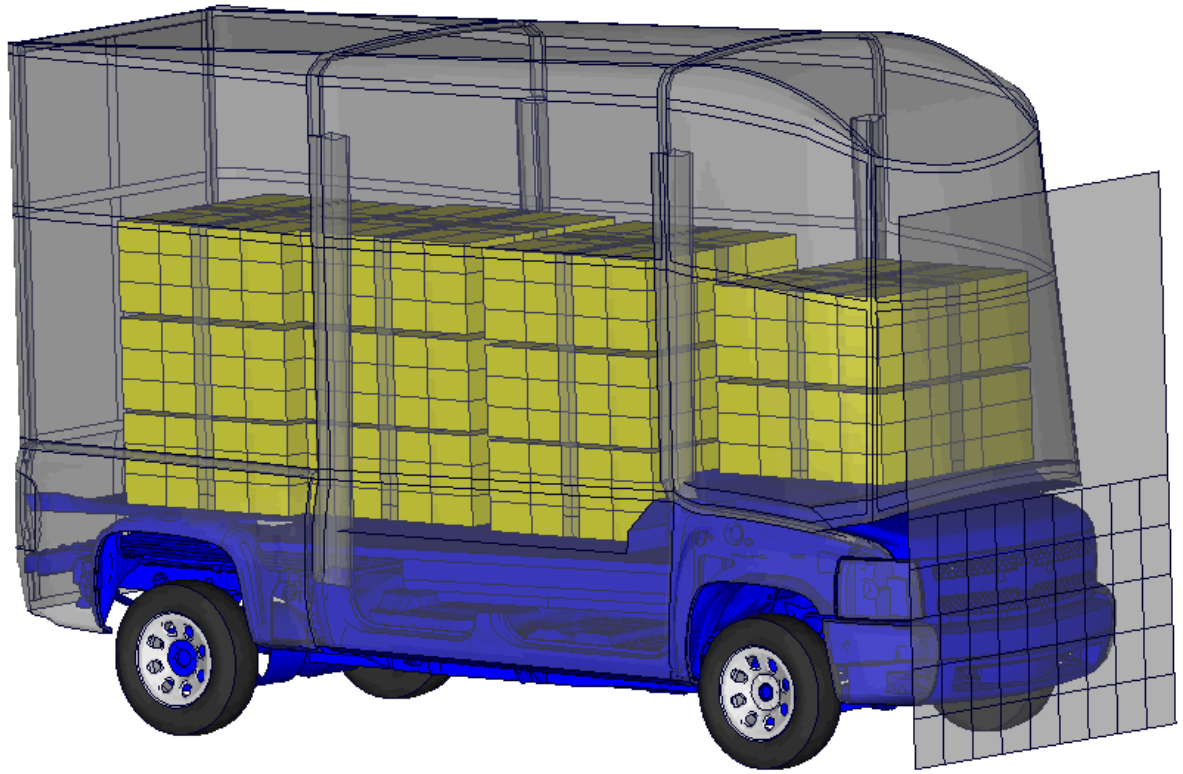


Accelerometers

- Left Rear Seat (Node 1167327)
- Right Rear Seat (Node 1167319)
- Vehicle C.G. Local (Node 1167332)
- Vehicle C.G. Global (Node 1167338)

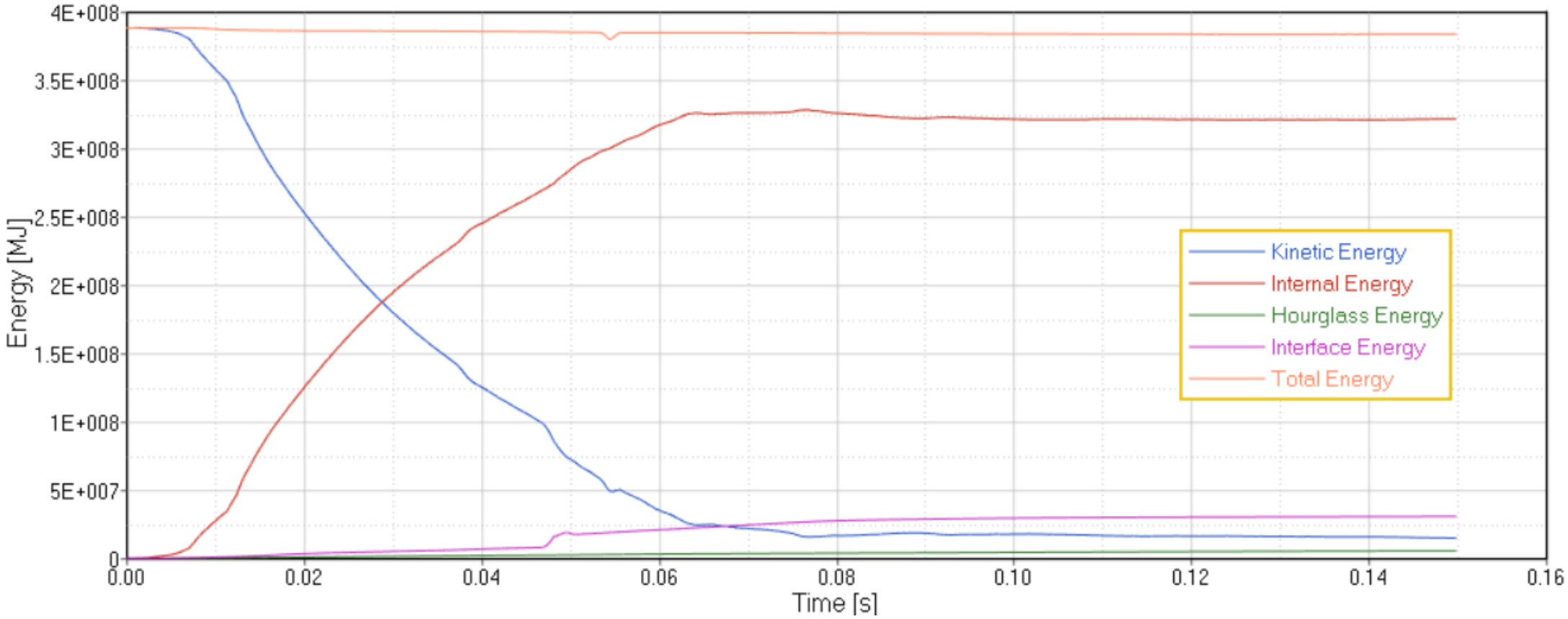


Simulation Benchmark

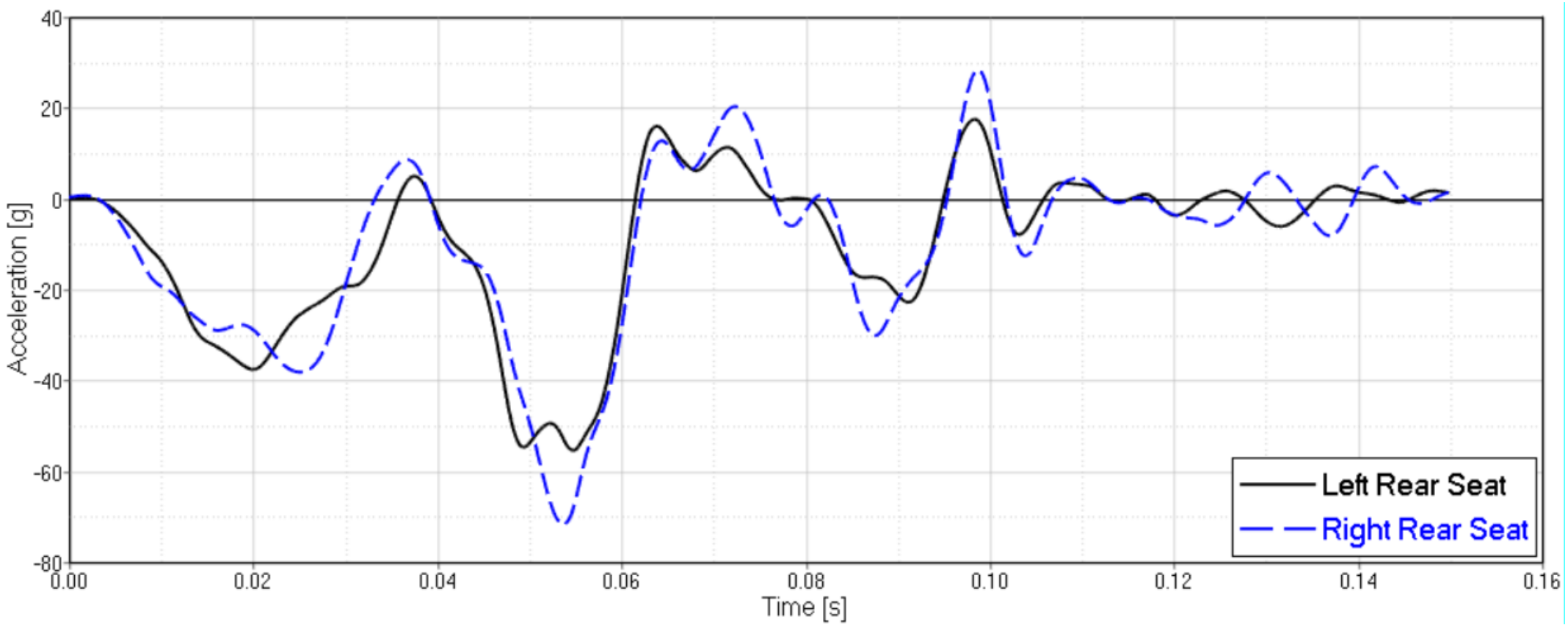


LS-DYNA	
Platform	Linux RHEL 5.4
Version	MPP s R9.3.0
Revision	128342
Precision	Single precision (I4R4)
Turn around time (150ms)	1 hour 0 minutes
Number of processors	16

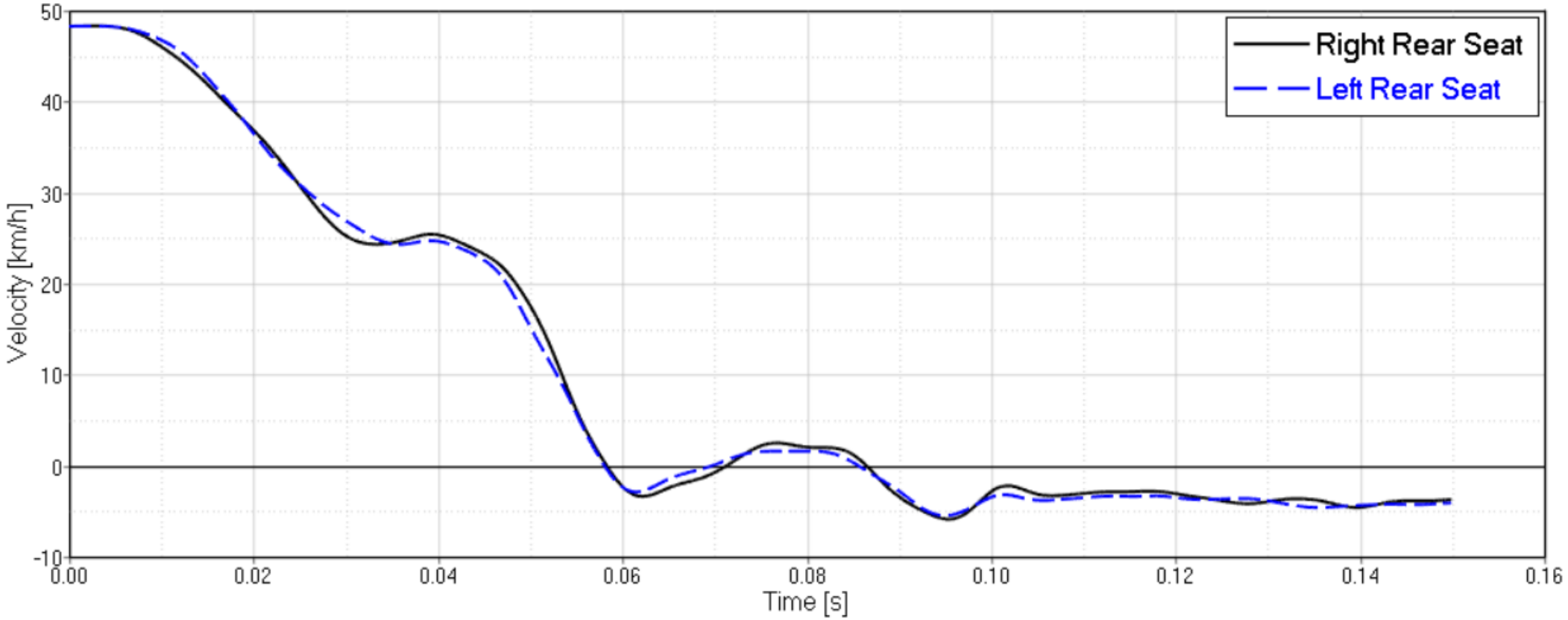
Full Frontal Impact – 48 km/h – Energy Summary



Full Frontal Impact – 48 km/h – X-Acceleration



Full Frontal Impact – 48 km/h – X-Velocity



Full Frontal Impact – 48 km/h – Force vs. Displacement