PSI-03-03

Australian Government
Department of Infrastructure and Transport

Transport Canada

Joint Australian and Canadian Pole Side Impact Research

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3rd Meeting - GRSP Informal Group on Pole Side Impact

Washington DC, USA, 9 June 2011

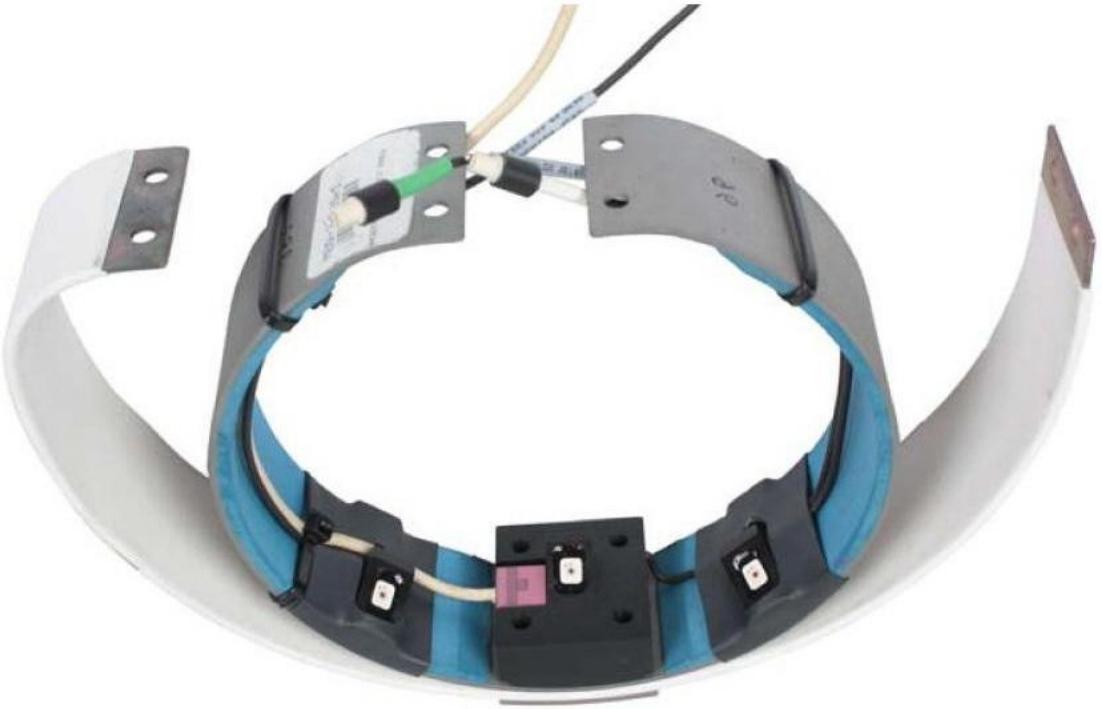
Program Overview

- Research jointly funded by Australian Government Department of Infrastructure and Transport, and Transport Canada.
- Paired comparisons of 29 km/h perpendicular and 32 km/h oblique pole side impact tests with WorldSID ATDs.
- Canadian market vehicles including Chevrolet Cruze, Suzuki Kizashi, Mitsubishi RVR (ASX), and Mazda 2.

Test Dummies

- Struck (left/driver) side WS 50th instrumented with RibEye multipoint rib deflection measurement system.
- Non-struck (right/passenger) side WS 50th instrumented with 1D-IRTRACC rib deflection measurement system.

RibEye



Py = IRTRACC pivot-to-pivot dimension of an unloaded rib

Rx = RibEye middle LED position change in the X direction.

Ry = RibEye middle LED position change in the Y direction.

Rz = RibEye middle LED position change in the Z direction.

$$\text{IRTRACC Deflection} = Py - \text{sqrt}[(Py - |Ry|)^2 + Rx^2 + Rz^2]$$

Source: Denton / Boxboro Systems, Hardware Users Manual RibEye™ Multi-Point Deflection Measurement System 3-Axis Version for the WorldSID 50th ATD, July 2009, pg 22.

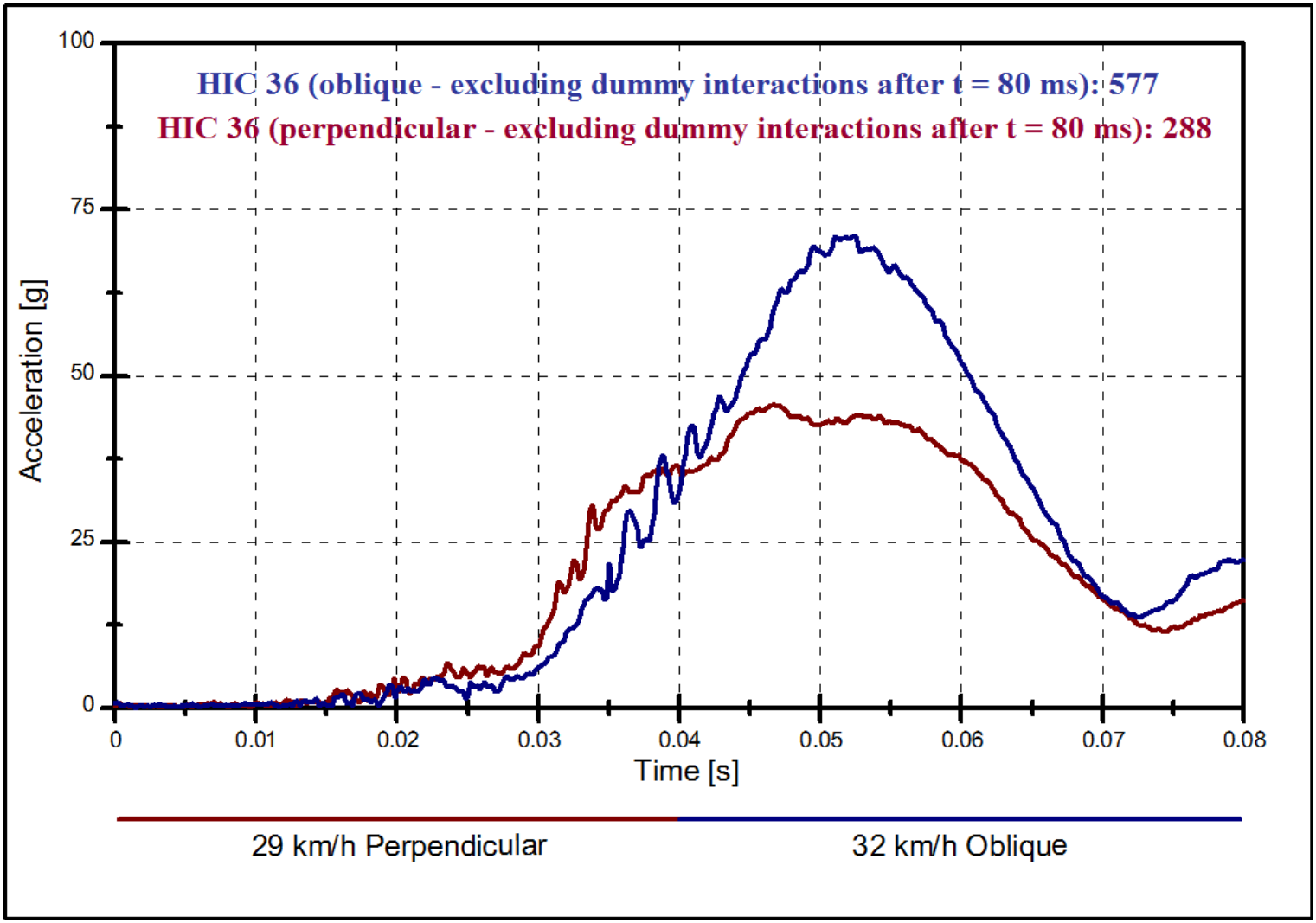
Chevrolet Cruze

29 km/h Perpendicular

32 km/h Oblique

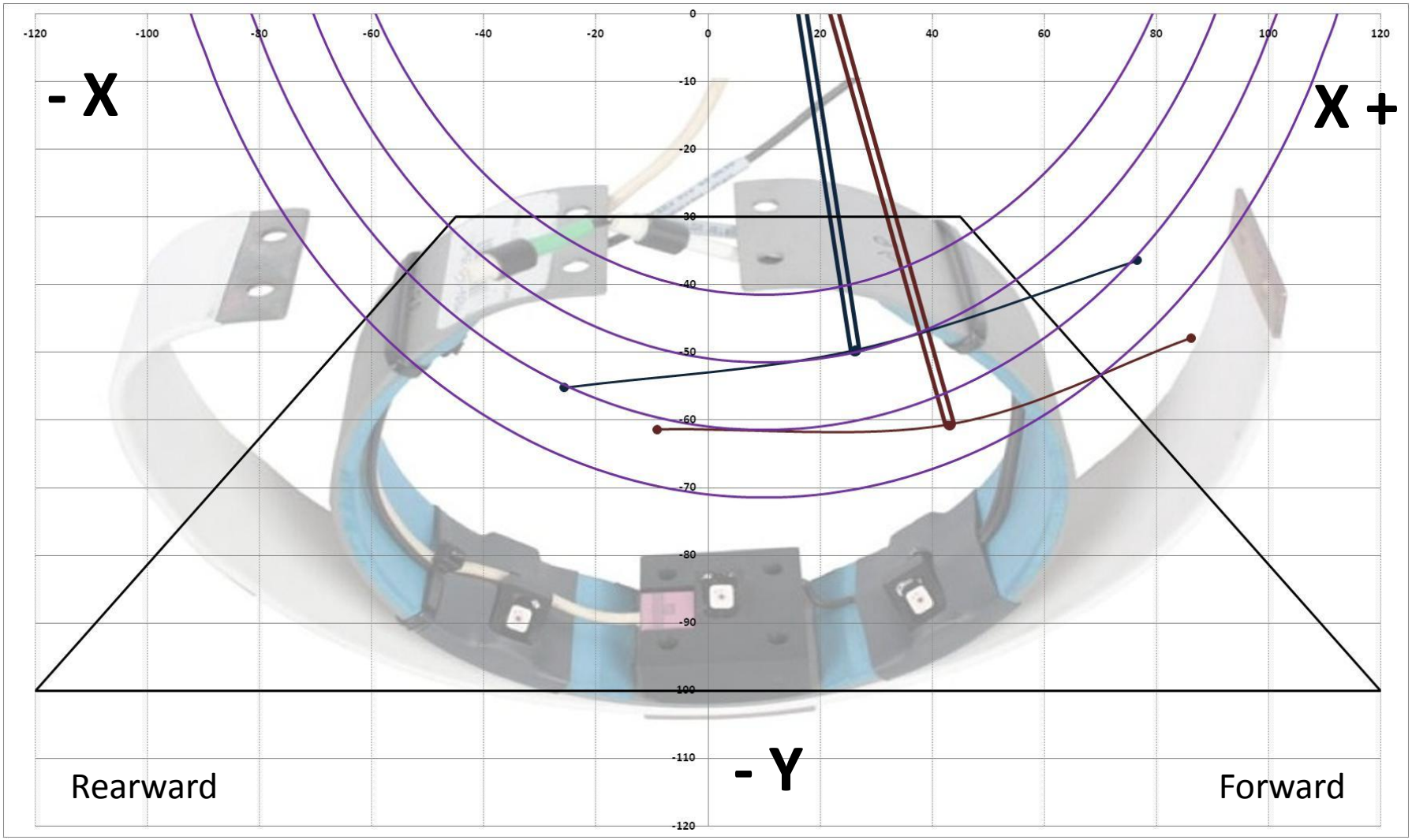
Chevrolet Cruze

Resultant Head Acceleration Response (0-80ms)



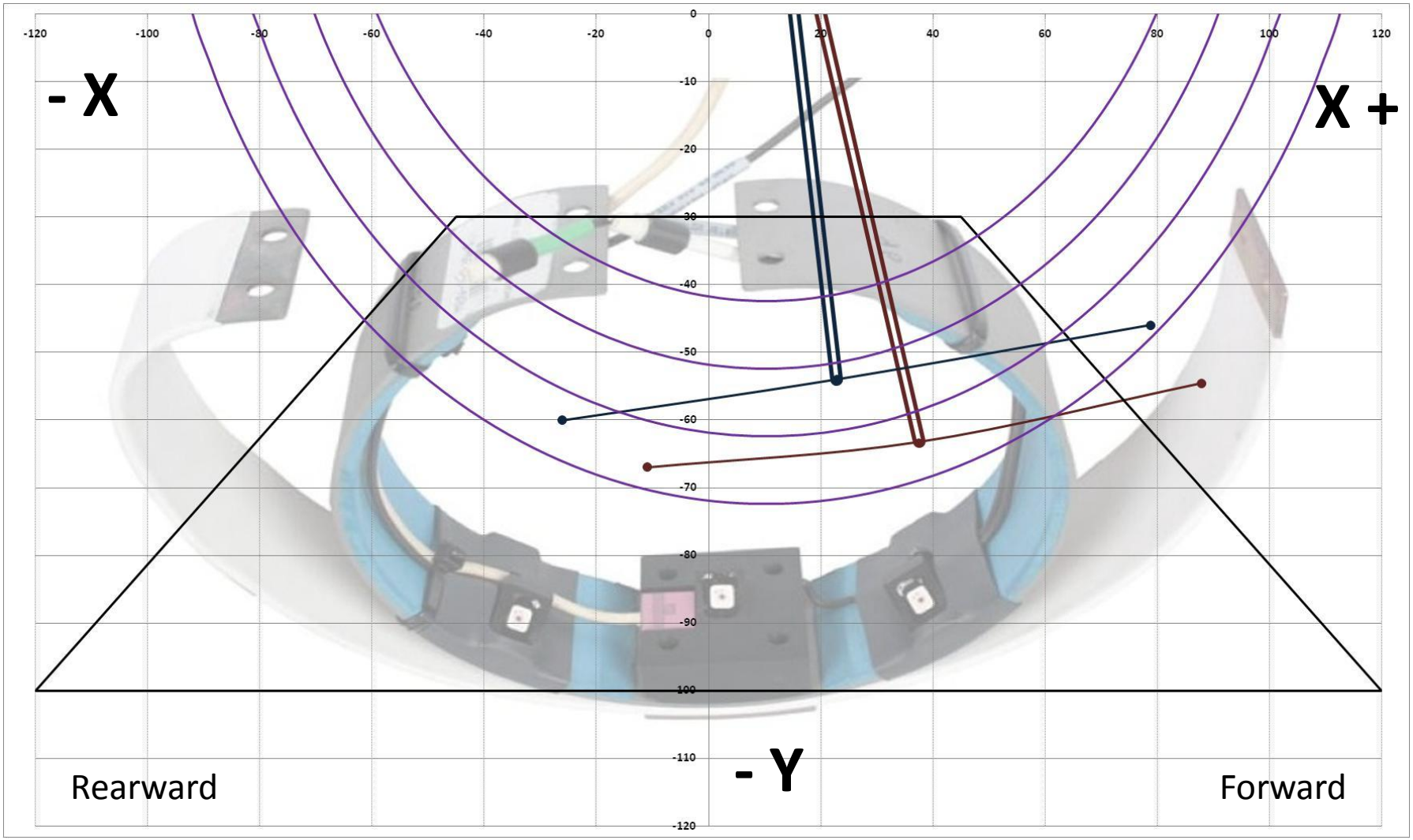
Chevrolet Cruze

X-Y Response (0-100ms): Thorax Rib 1



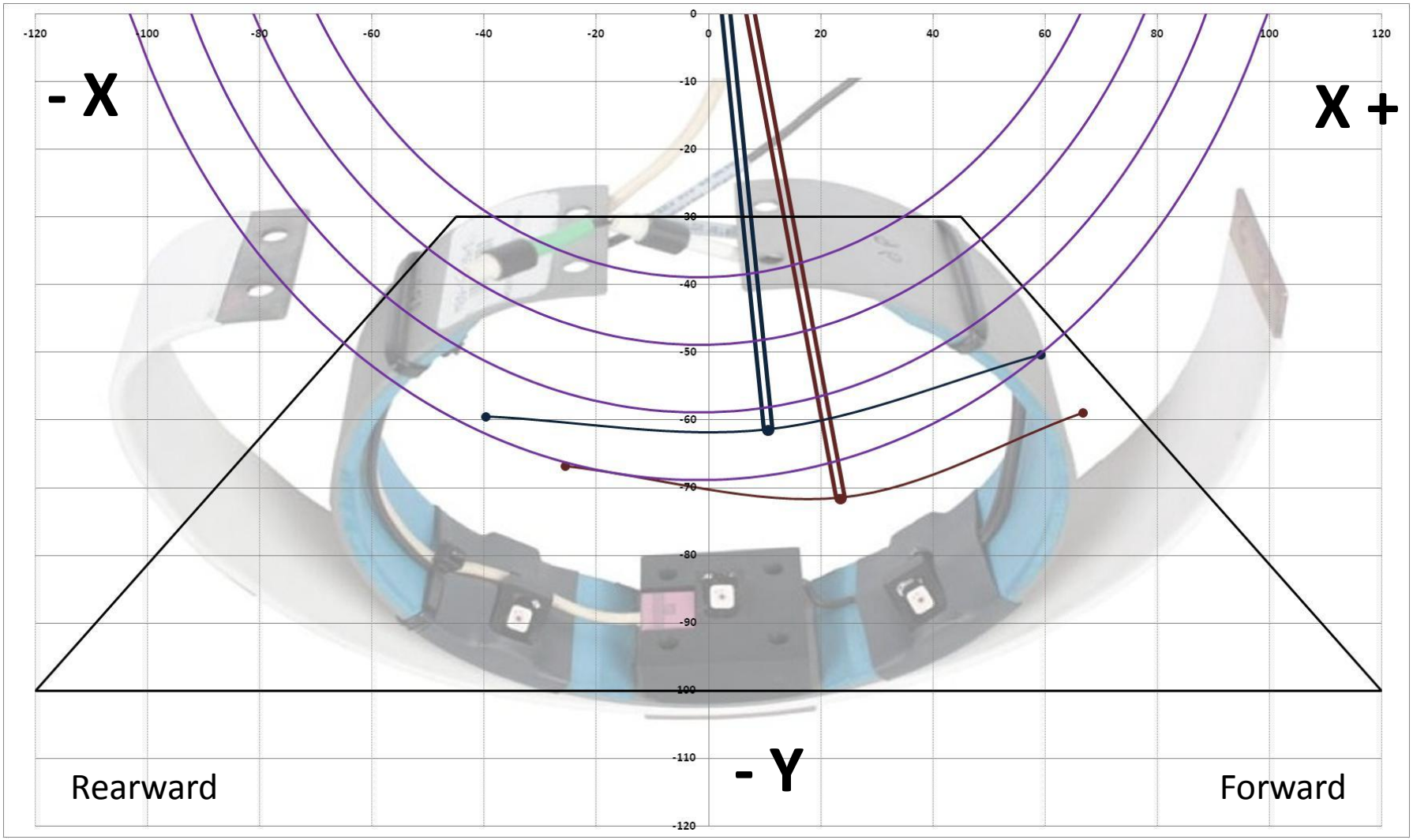
Chevrolet Cruze

X-Y Response (0-100ms): Thorax Rib 2



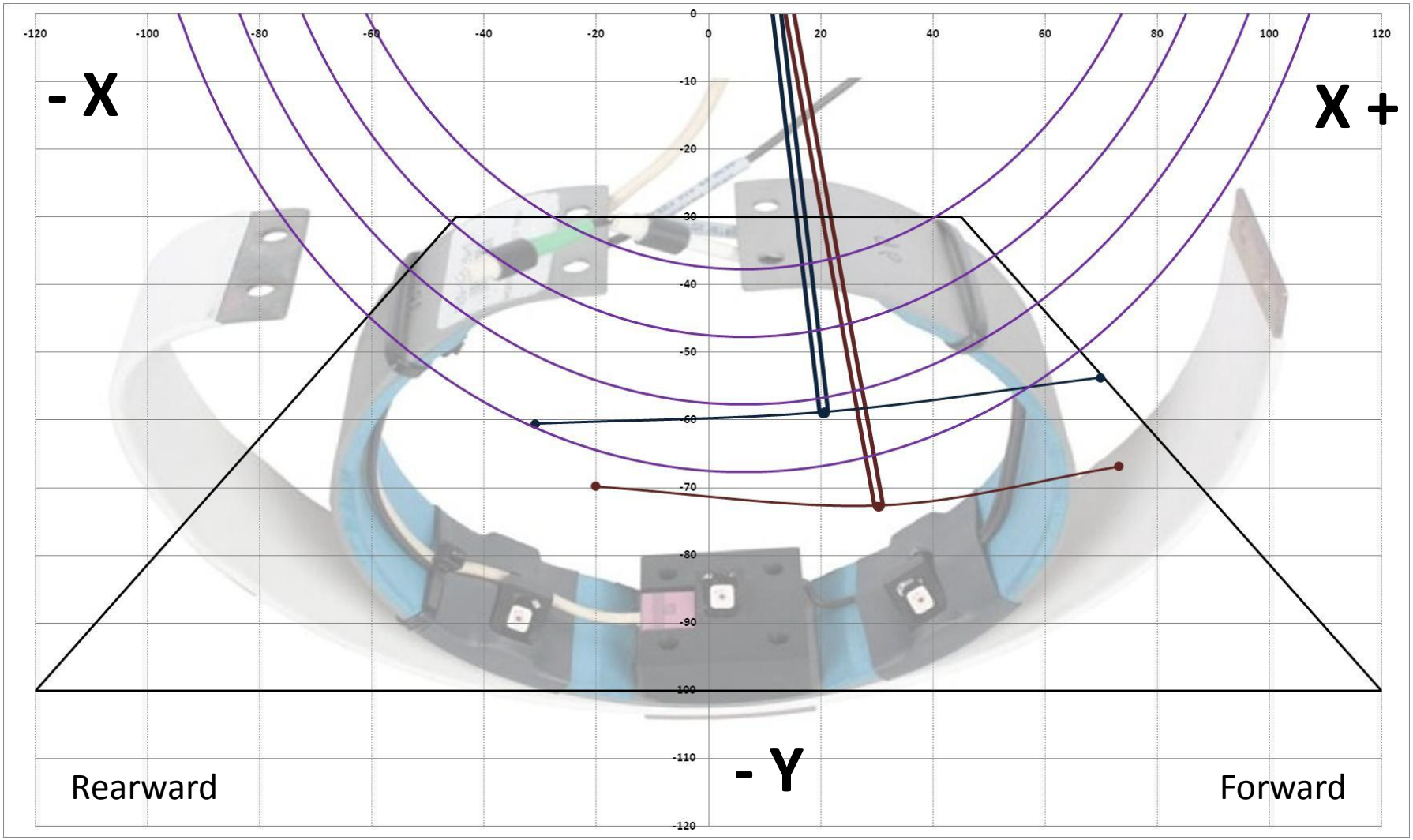
Chevrolet Cruze

X-Y Response (0-100ms): Abdomen Rib 1



Chevrolet Cruze

X-Y Response (0-100ms): Abdomen Rib 2

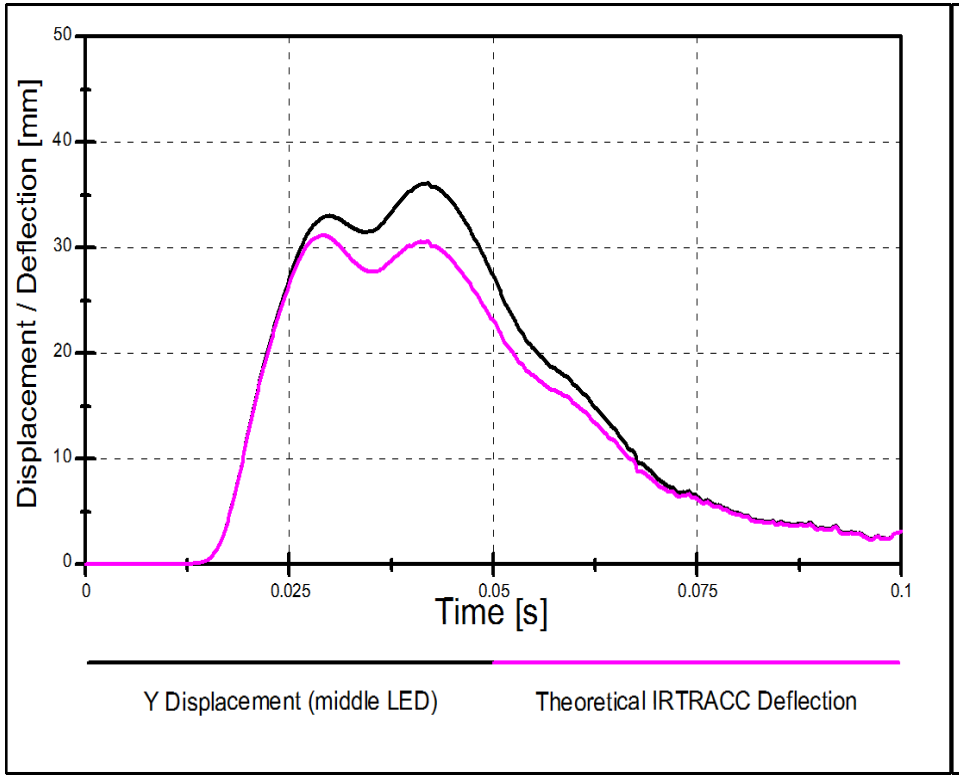


Chevrolet Cruze

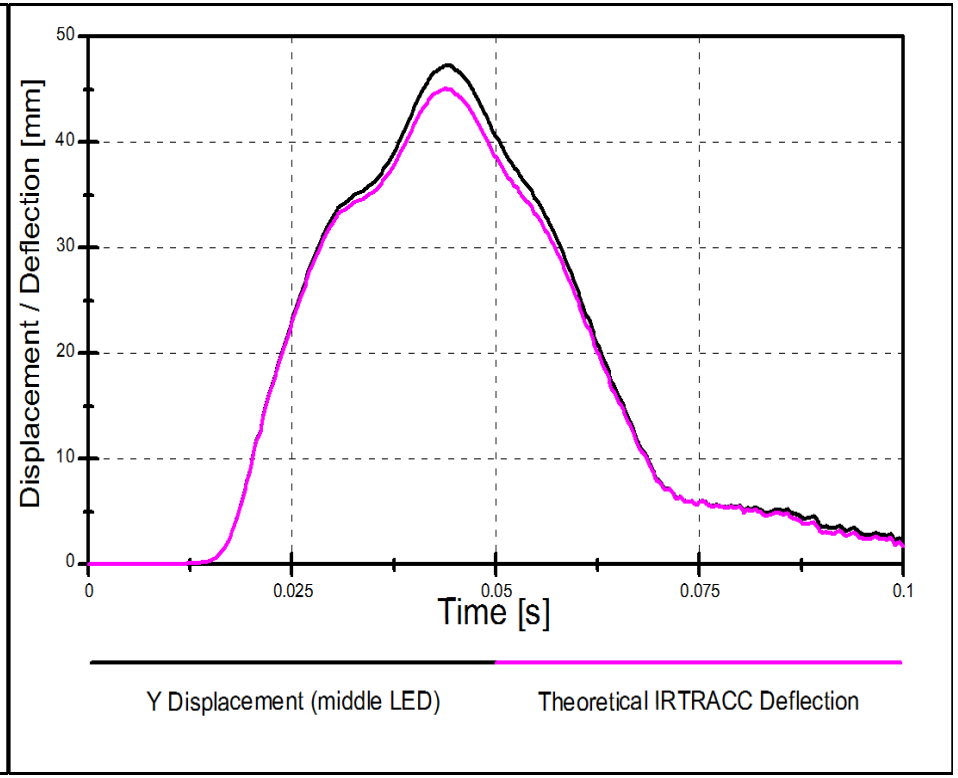
Sample Comparison (Thorax Rib 1):

Theoretical IRTRACC Deflection vs Middle LED Y-axis Displacement

29 km/h Perpendicular



32 km/h Oblique



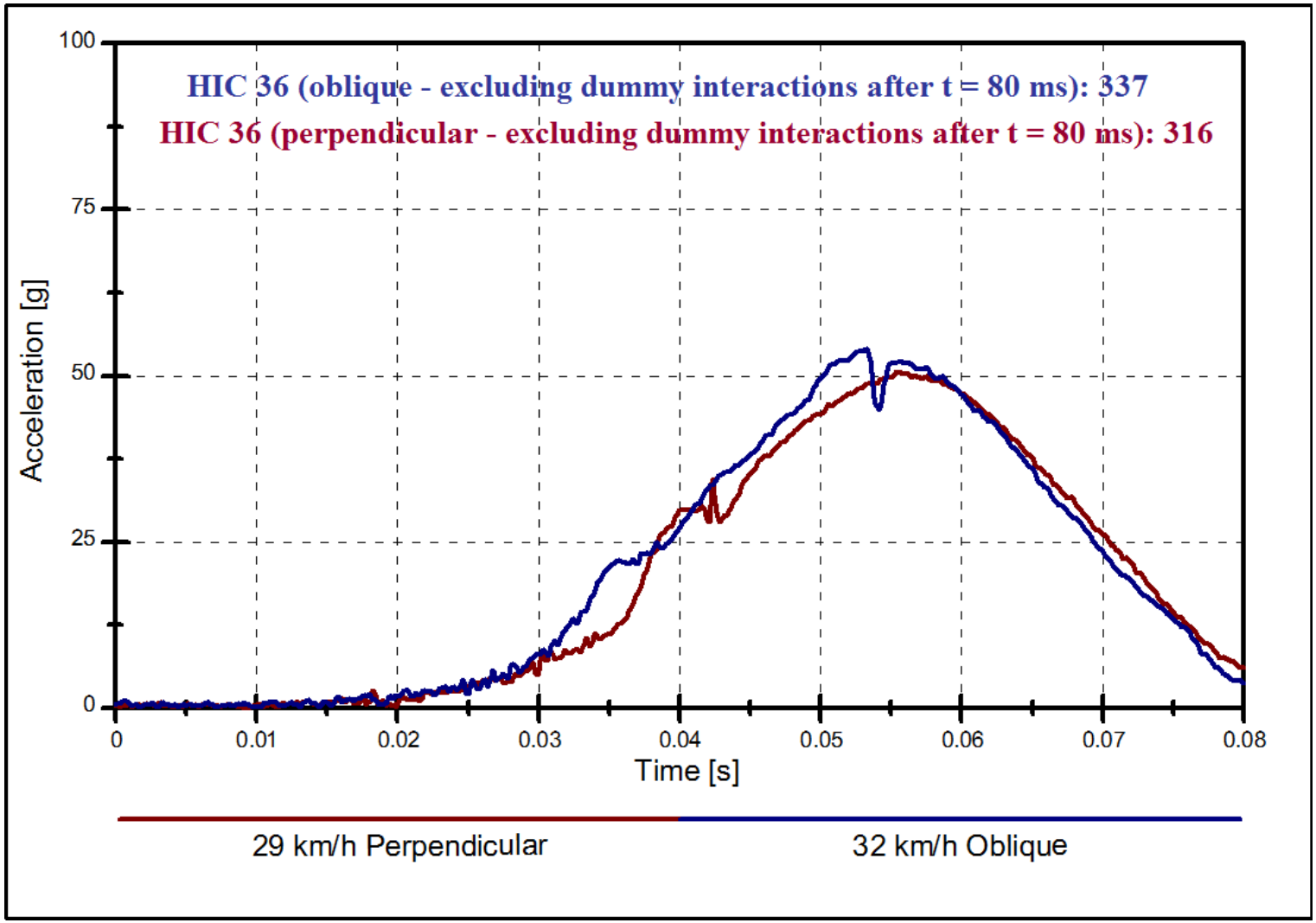
Suzuki Kizashi

29 km/h Perpendicular

32 km/h Oblique

Suzuki Kizashi

Resultant Head Acceleration Response (0-80ms)

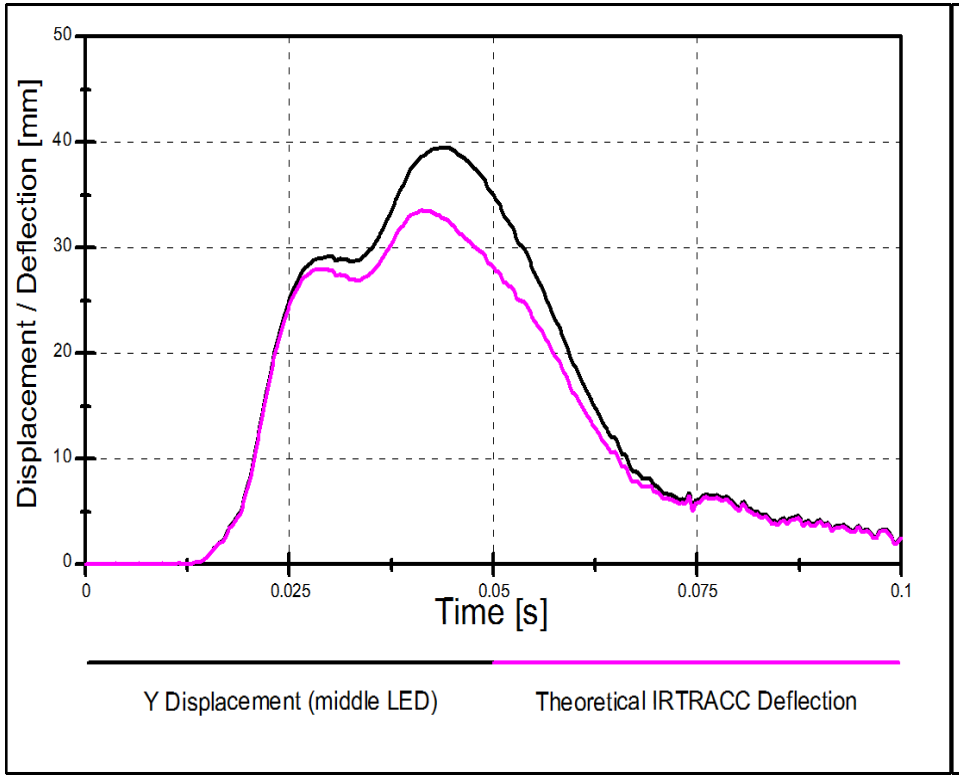


Suzuki Kizashi

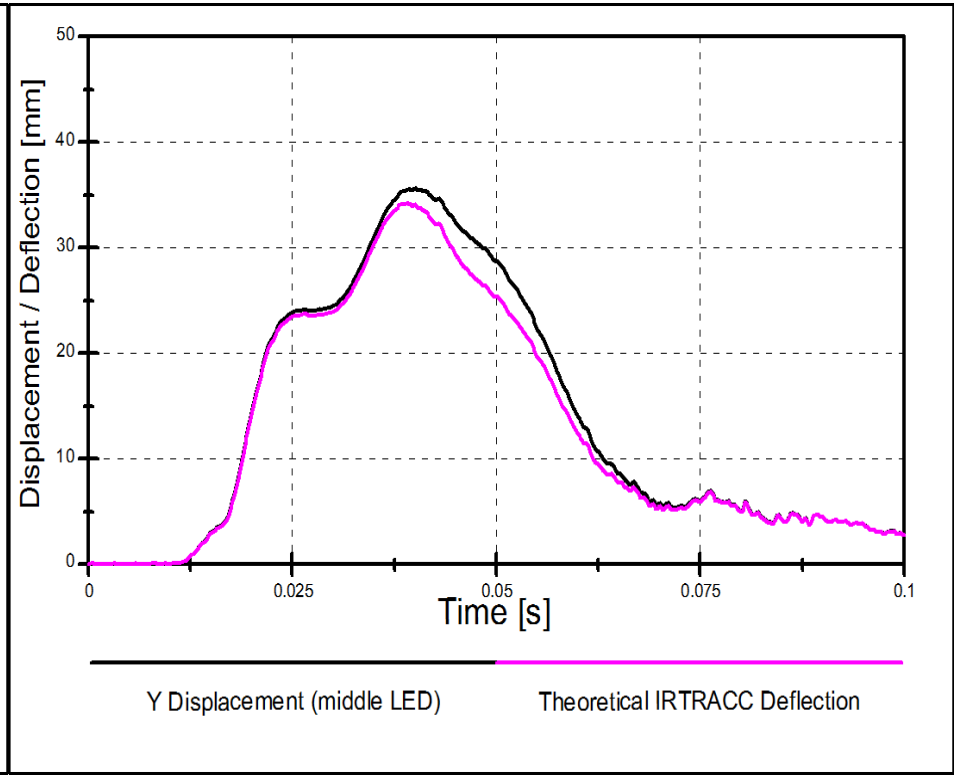
Sample Comparison (Thorax Rib 2):

Theoretical IRTRACC Deflection vs Middle LED Y-axis Displacement

29 km/h Perpendicular



32 km/h Oblique



Thank you