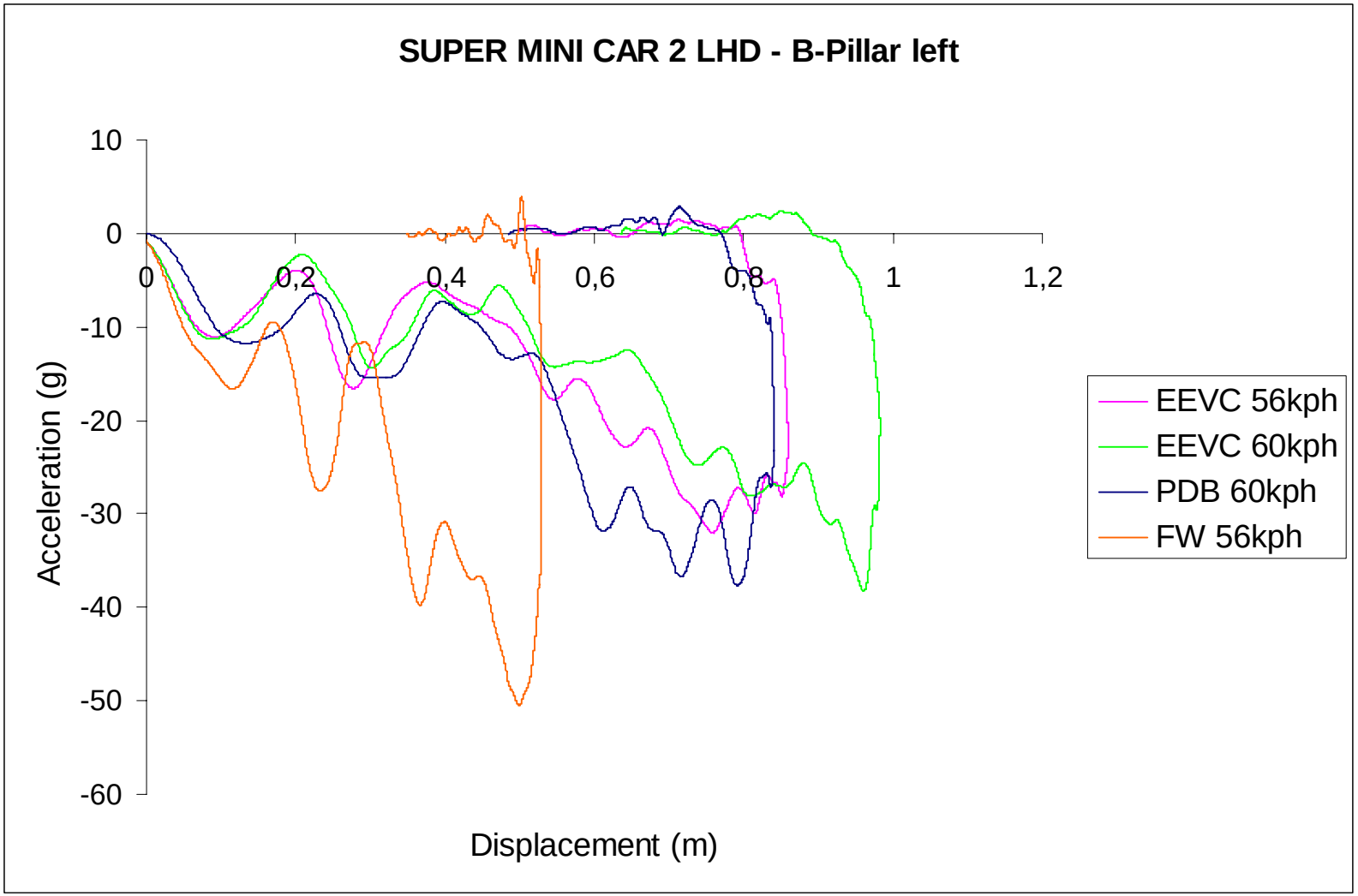
PDB Introduction in Frontal Impact Regulation

Influence of the PDB on the pulse

Pascal Delannoy

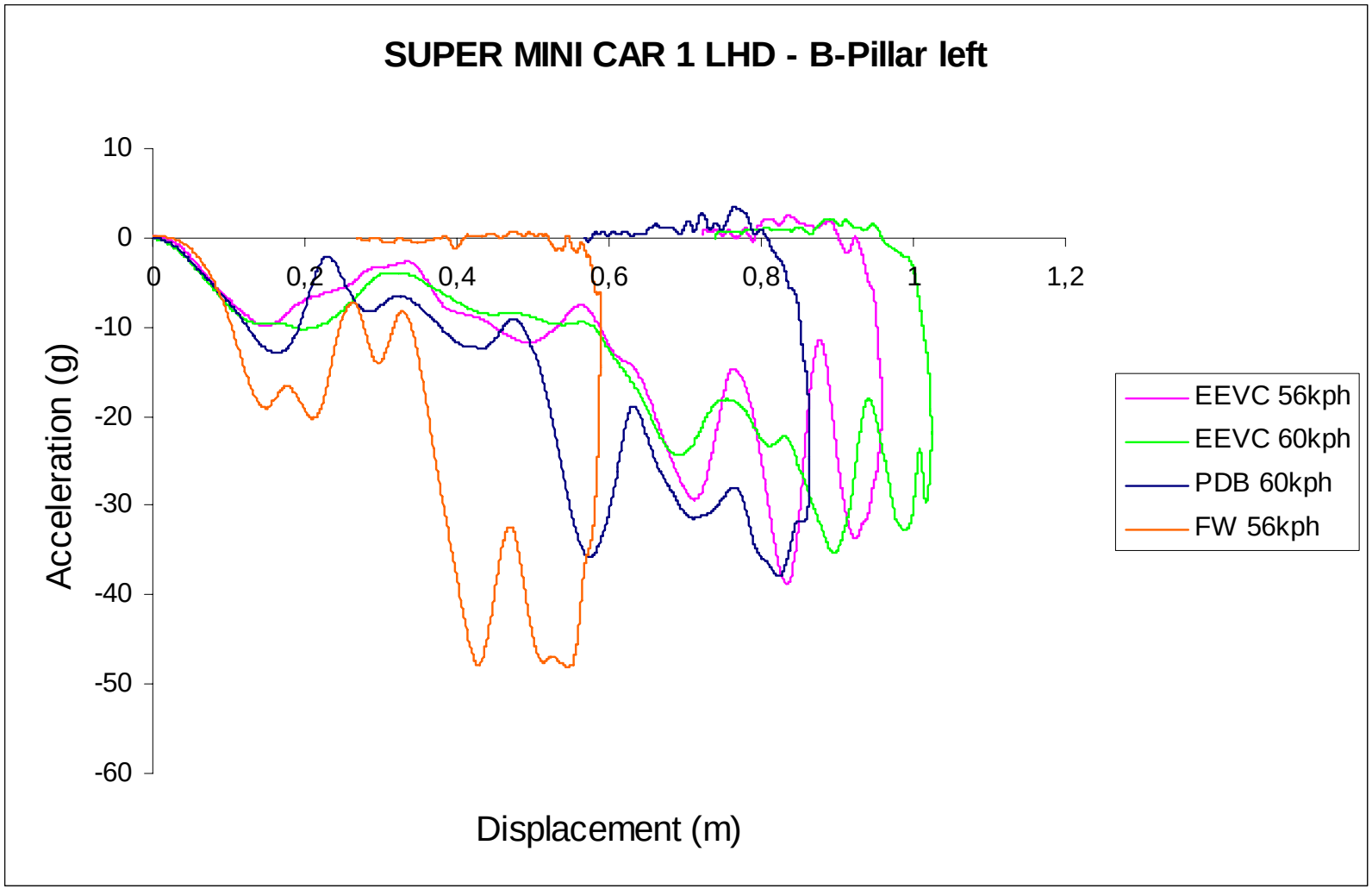
December, 2008

2- SELF PROTECTION: VEHICLE SEVERITY



⇨PDB test acceleration pulse is between ODB and FWRB

2- SELF PROTECTION: VEHICLE SEVERITY



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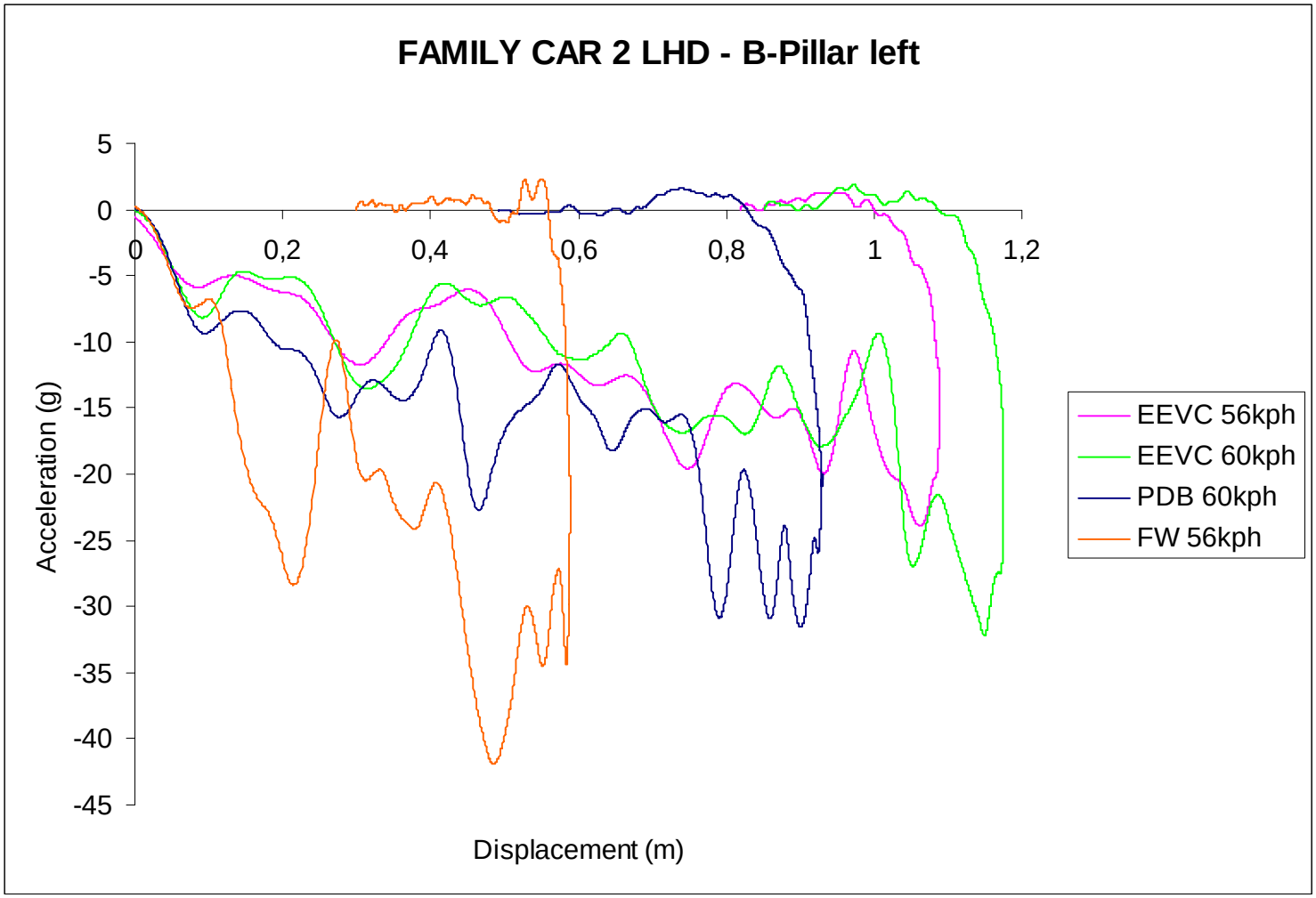
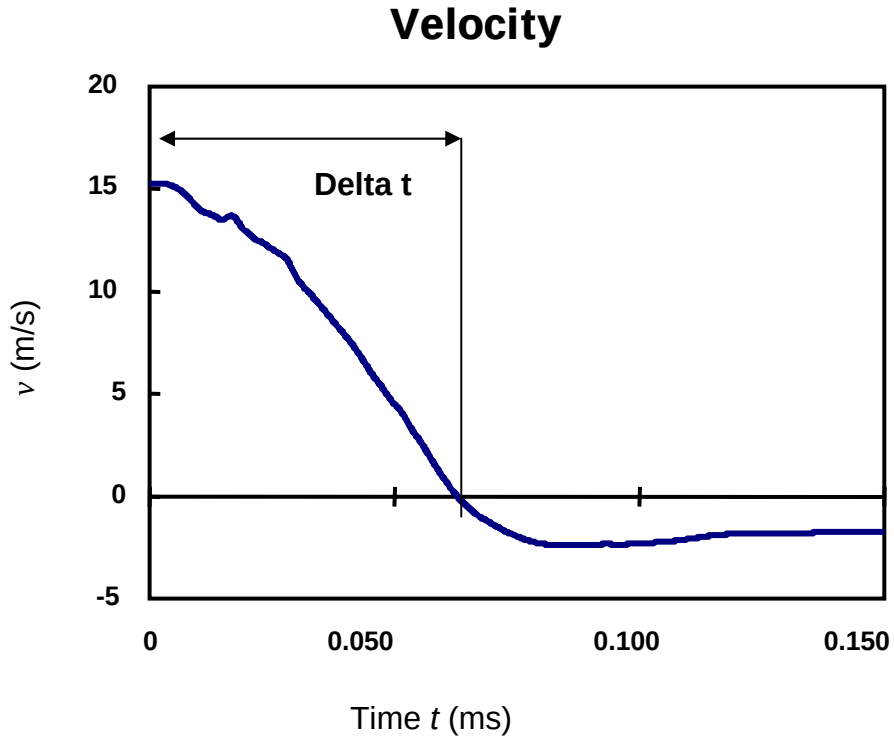


MEAN ACCELERATION DEFINITION

Vo



Mean acceleration = Vo / delta t

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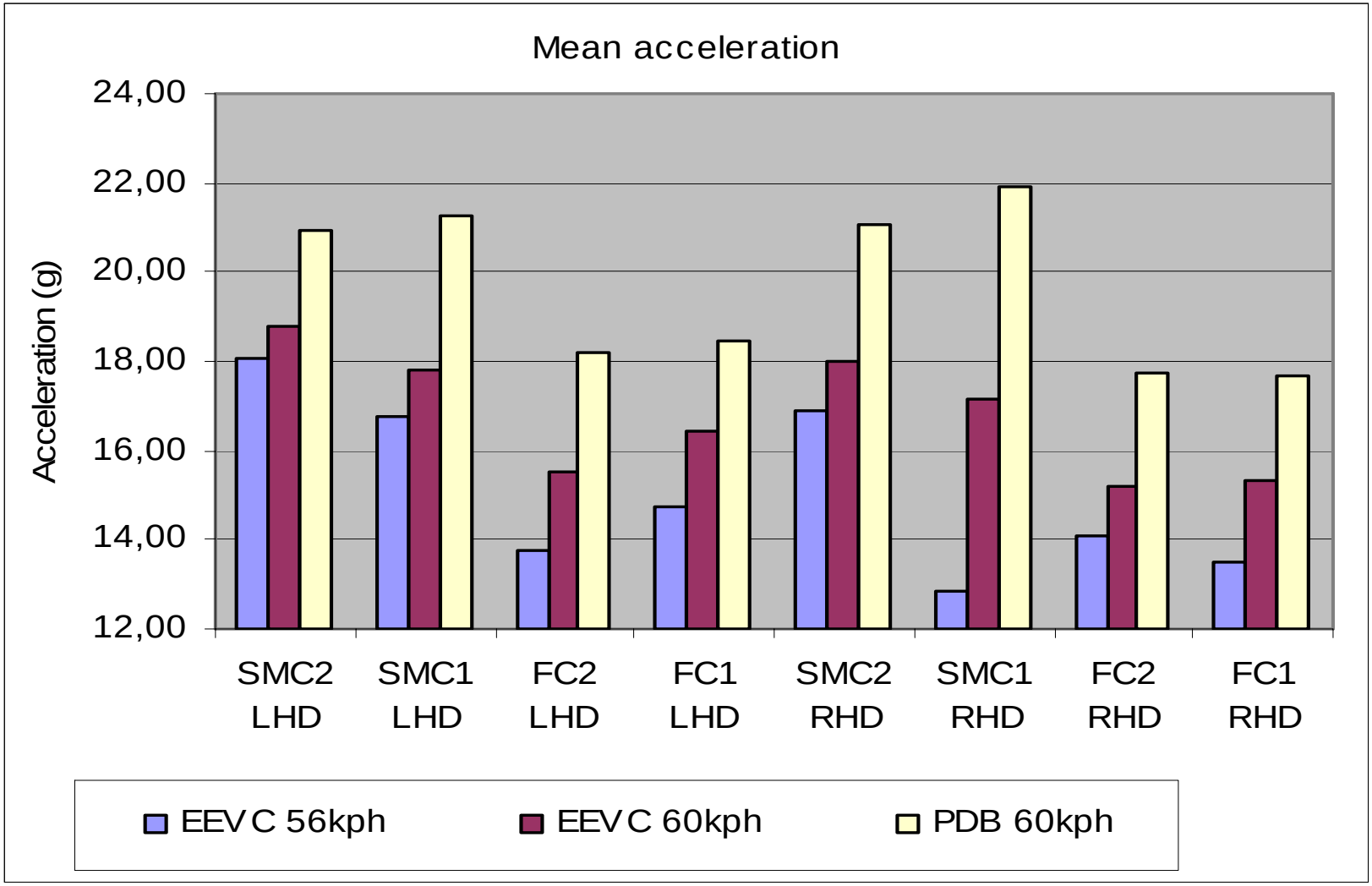
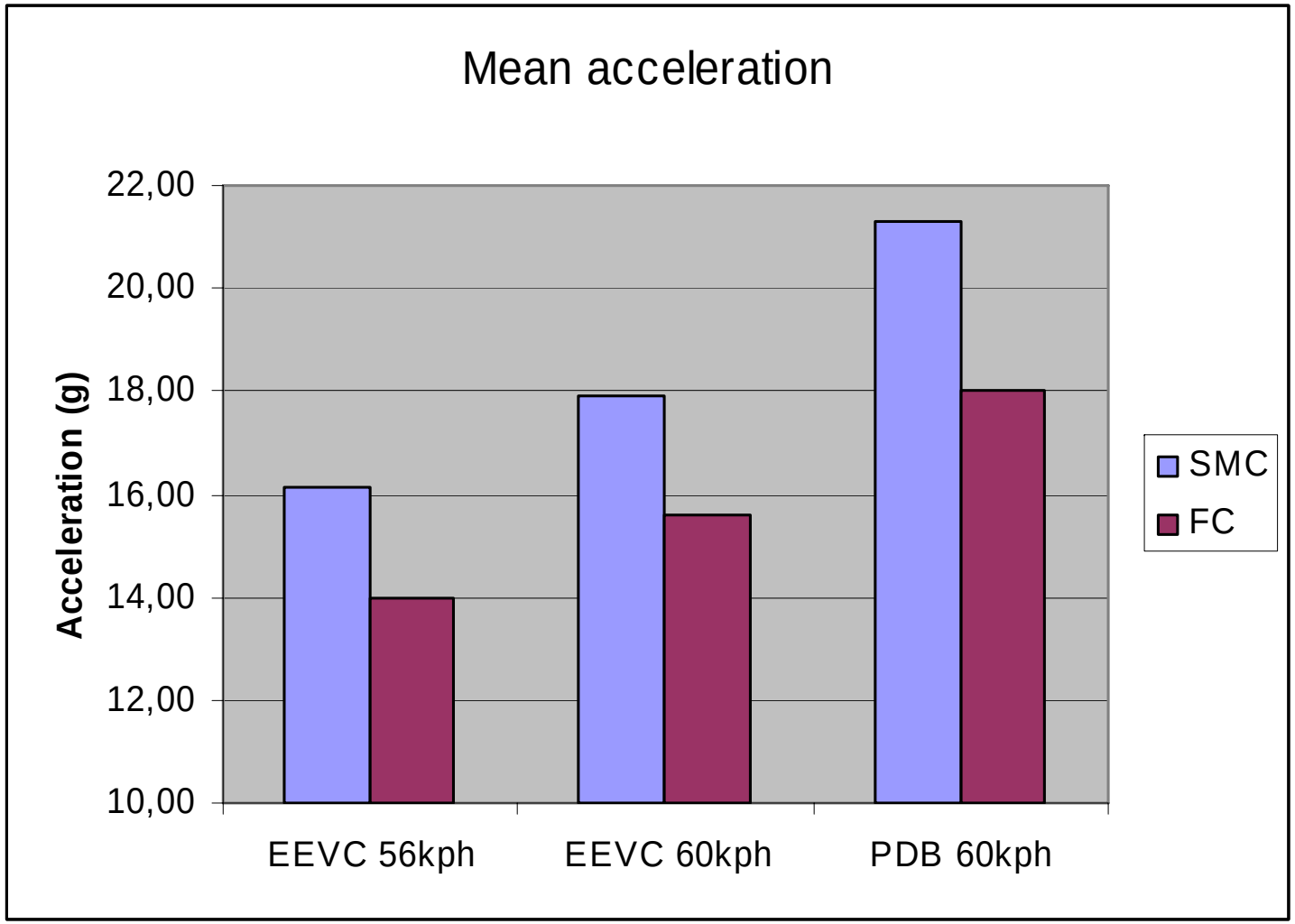


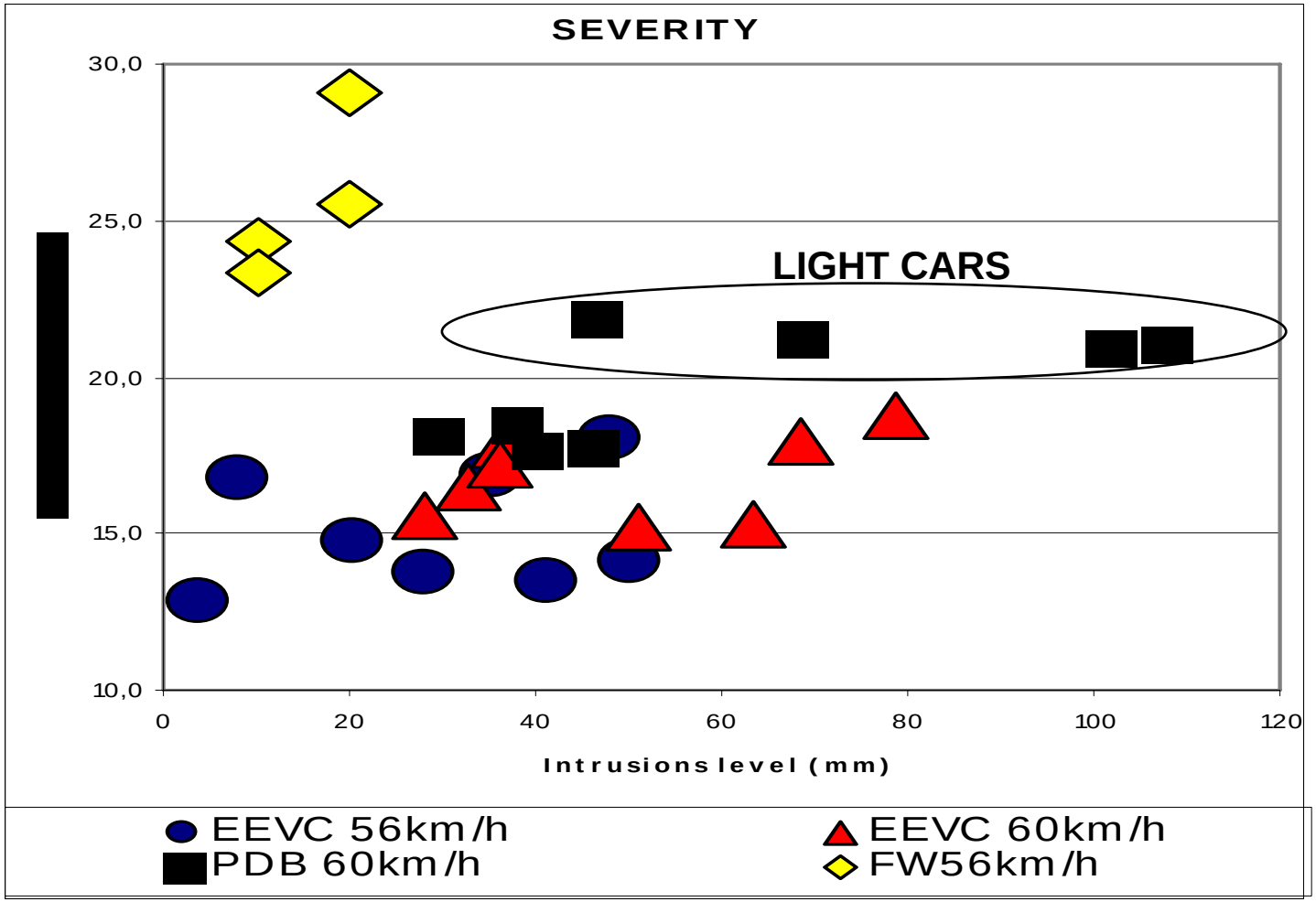
⇨Higher PDB acceleration pulse is validated for all vehicle masses

2- SELF PROTECTION: VEHICLE SEVERITY



⇨Higher acceleration compare with other offset test comparison

2- SELF PROTECTION: VEHICLE SEVERITY



⇨PDB test is a combination of acceleration and intrusion

CONCLUSION

MEAN ACCELERATION IS SEVERE BECAUSE:

⇨ BARRIER IS STIFFER >>> omega ↗ >> t ↘ >> gamma ↗

⇨ OVERLAP IS HIGHER >>> FORCE ↗ >> gamma ↗

⇨ TEST SPPEED IS HIGHER >>> Vo ↗ >> gamma ↗

Gamma = Vo / t , w= f(K/M), t = pi / w

Gamma = F / m

PDB TEST PULSE IS SEVERE FOR RESTRAINT

PDB Introduction in Frontal Impact Regulation

EES Calculation

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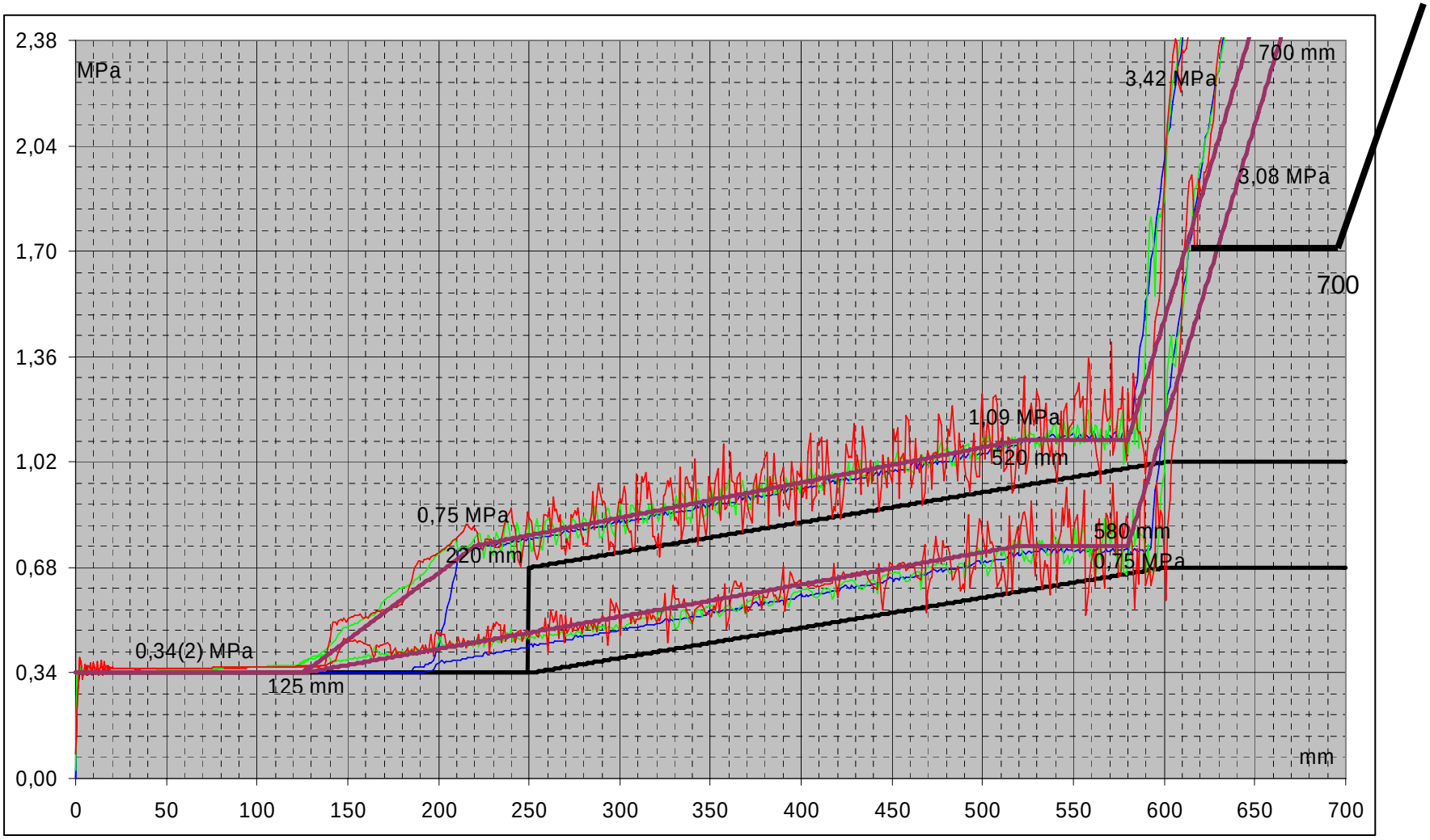
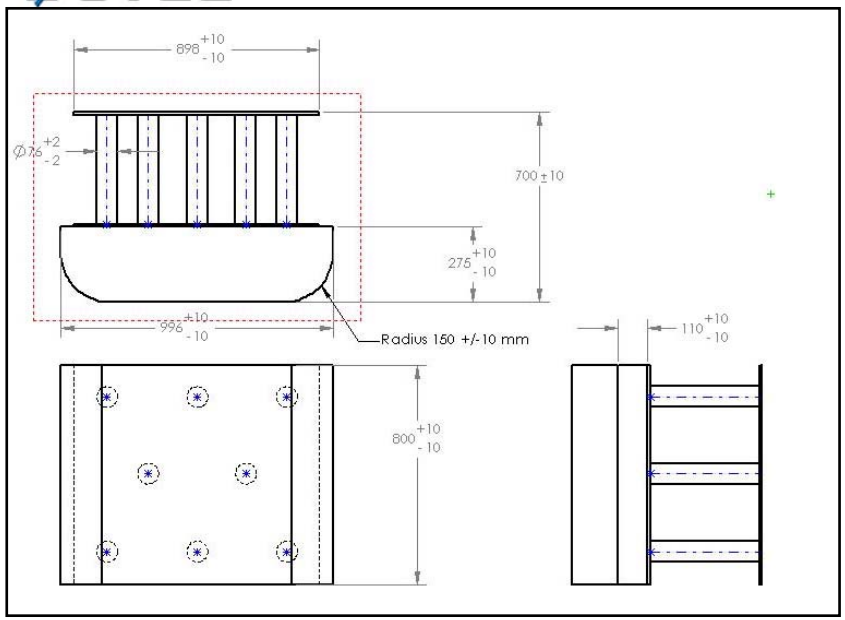


Practical

Theoretical (previous calculation)

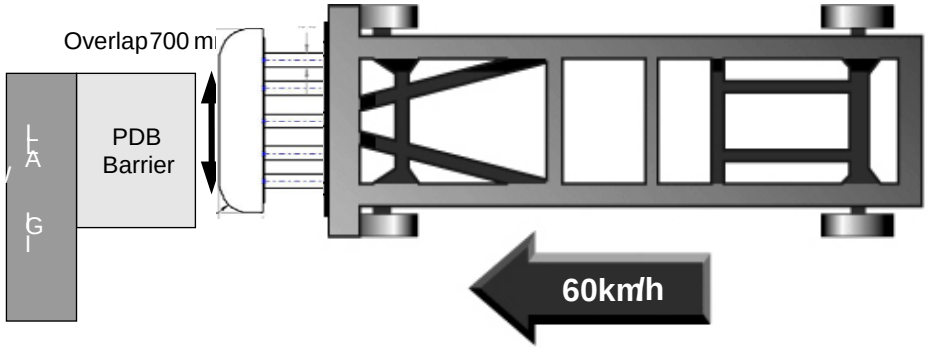
2- RIGID FLAT IMPACTOR



Step 1: Definition and manufacturing of the impactor

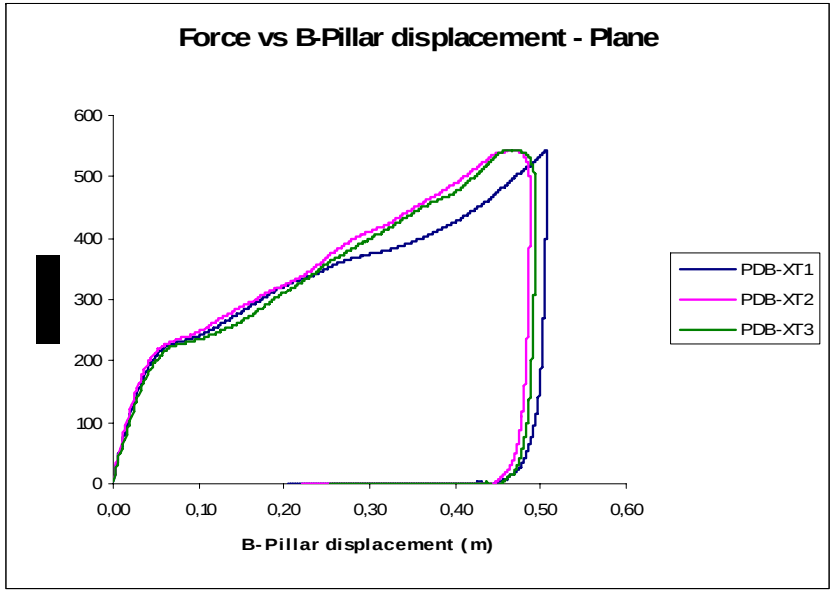
Step 2:

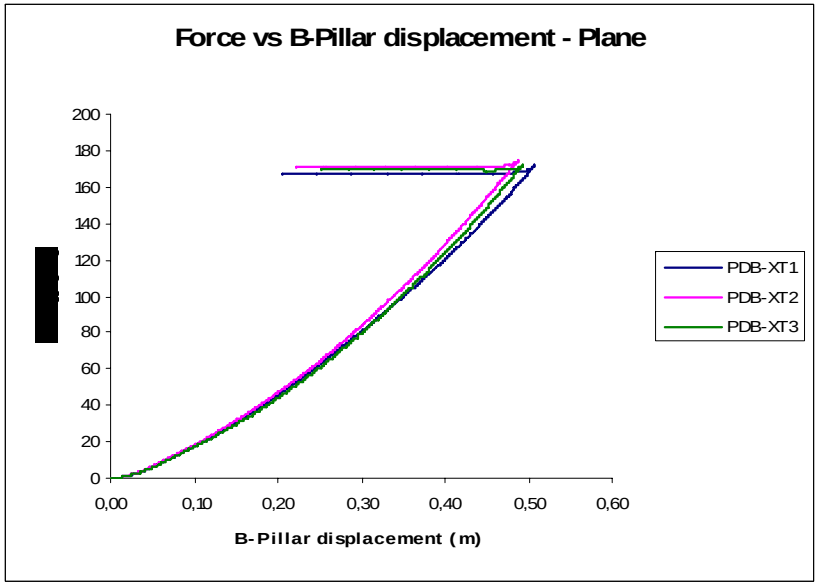
Test parameters definition

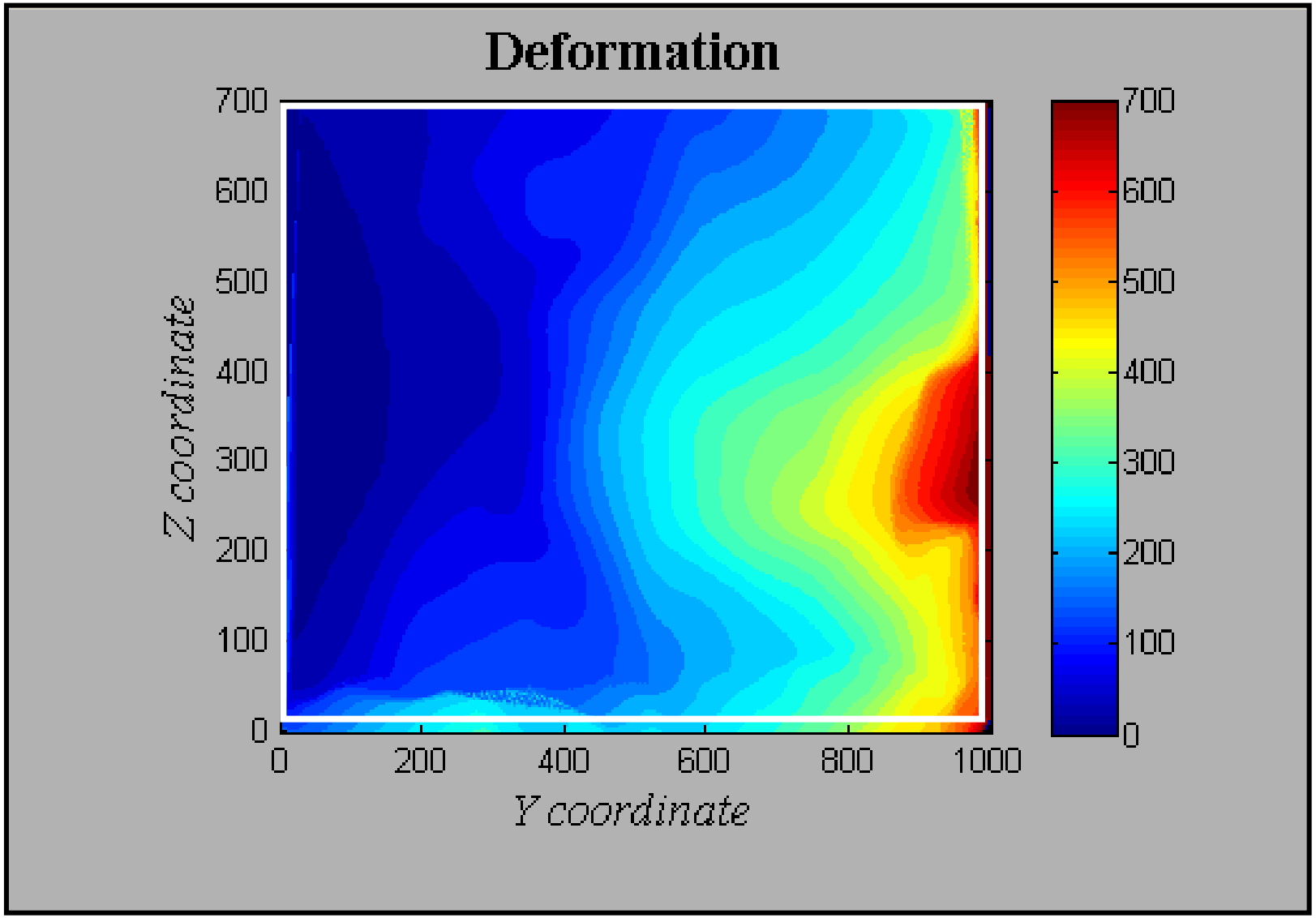


2- RIGID FLAT IMPACTOR

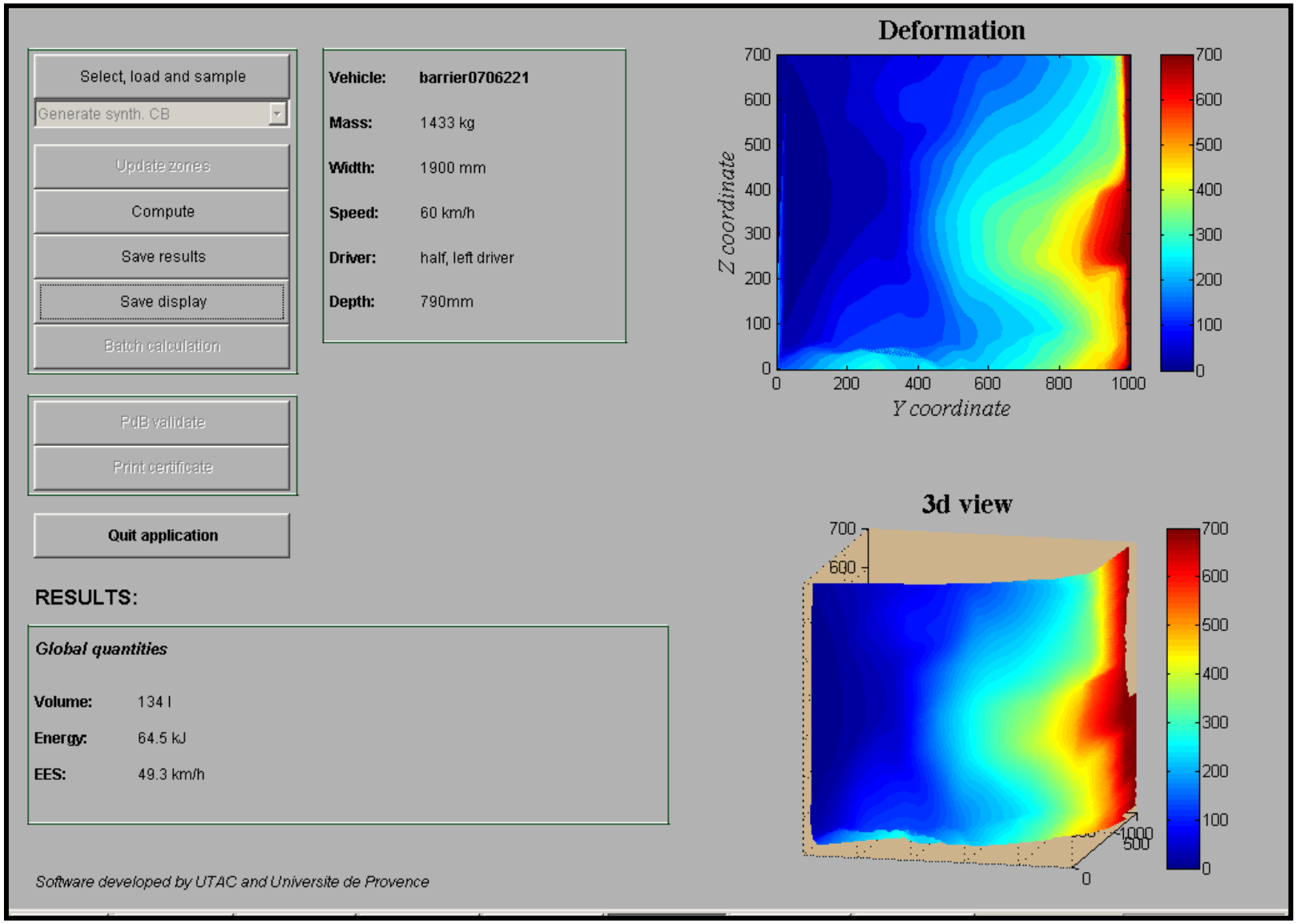
IMPACTEUR PLAN	
	PDB-XT 1
Calculated energy (kJ)	171
% error on energy (calculated / kinetic)	4.5 %
Max. Force (kN)	543
Max. displacement (mm)	507
F=Mγ	ok



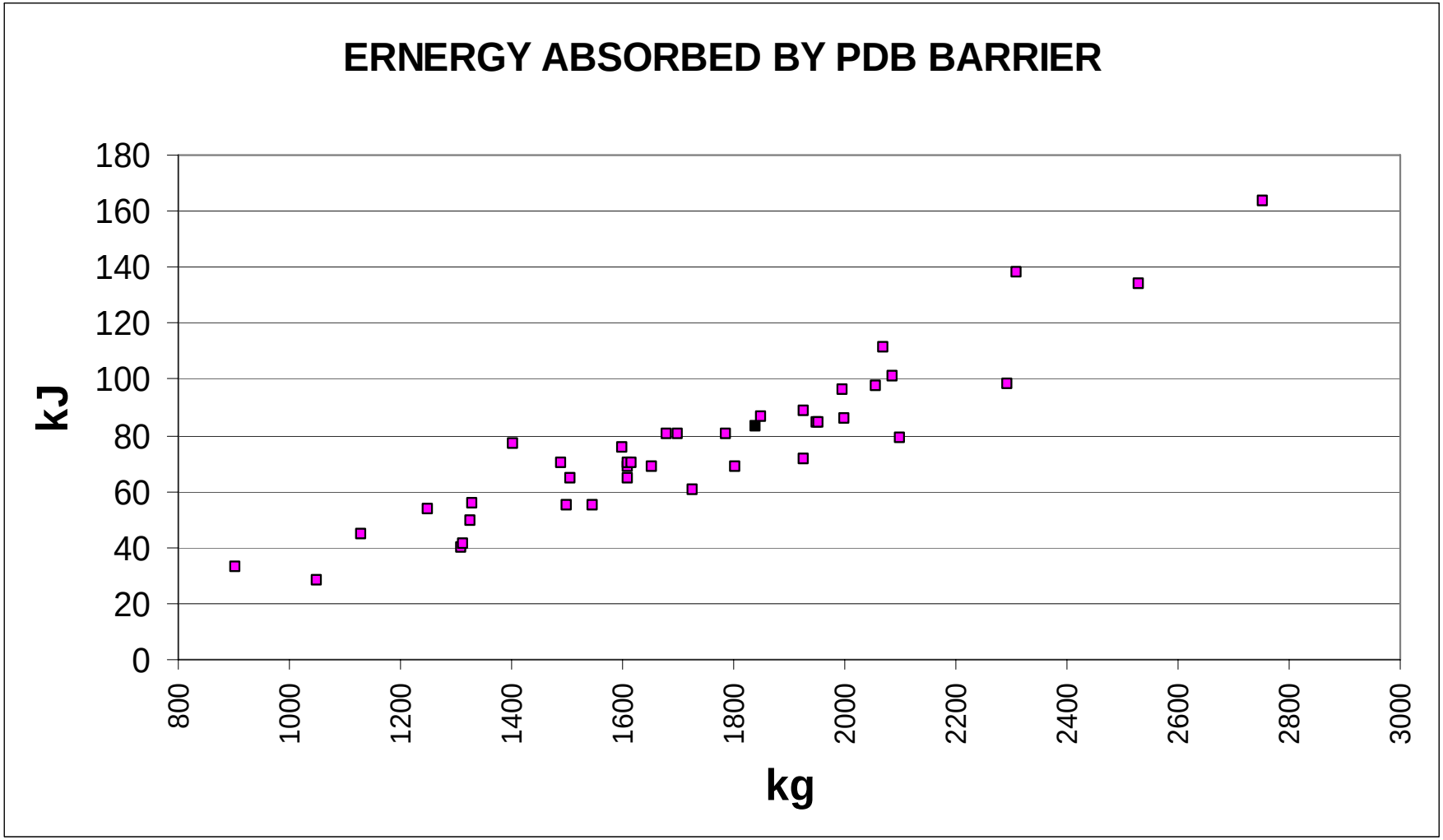



Deformation
Z coordinate
Y coordinate
0
100
200
300
400
500
600
700
0
200
400
600
800
1000

YEAR 2007: PDB SOFT 2



Analysed based on 49 PDB test at 60 kph



EES Calculation

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