

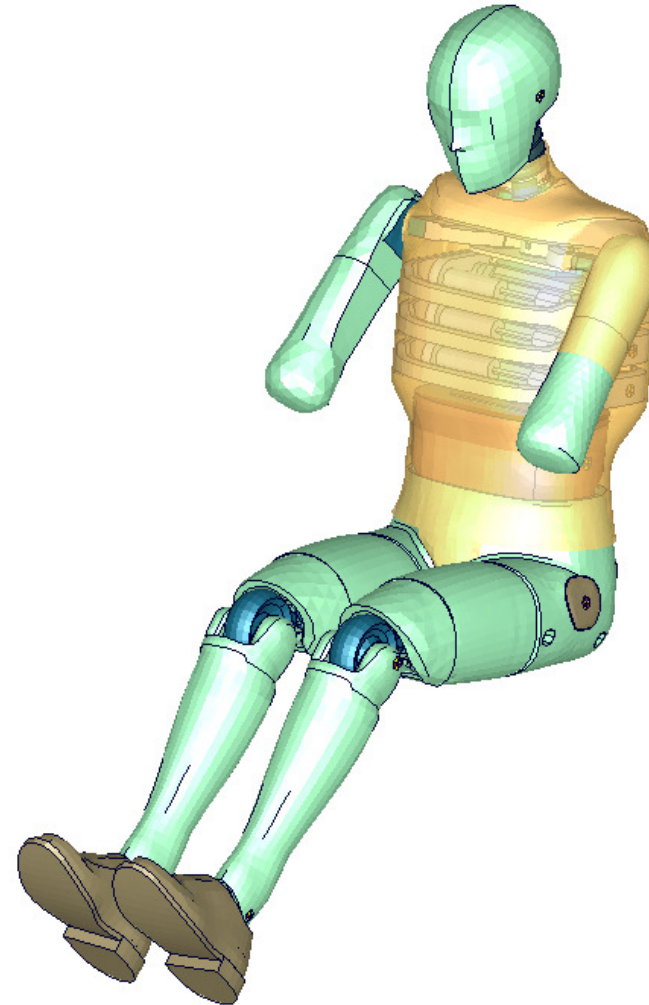
PDB ES2 /ES2re

Project for detailed validation and model update.

Investigations are made on

- material
- component
- full assembled dummy

level.



The PDB and its work

- Partnership for **D**ummy Technology and **B**io**m**echanics
- Members



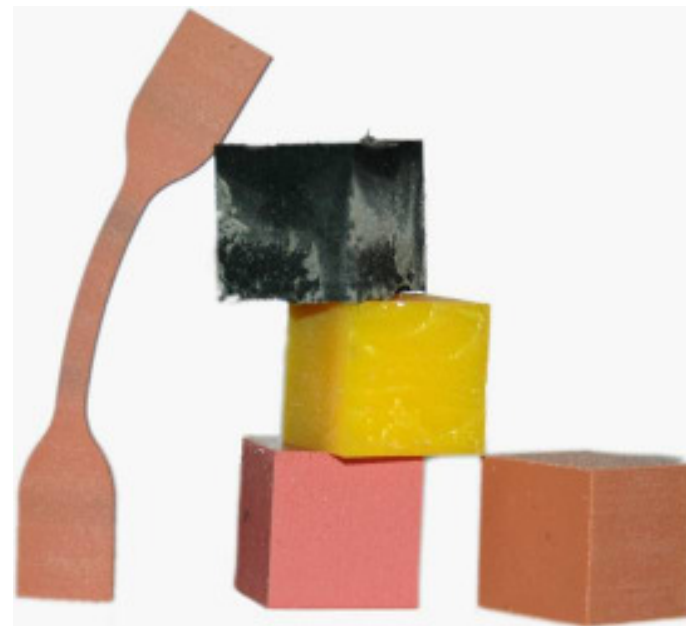
- Task
 - Providing a WSID 50th finite element model for the crash codes used by the members
 - Similar to known FAT projects
- Project budget over 1 100 000 \$

PDB ES2 /ES2re

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New additional material tests are done for:

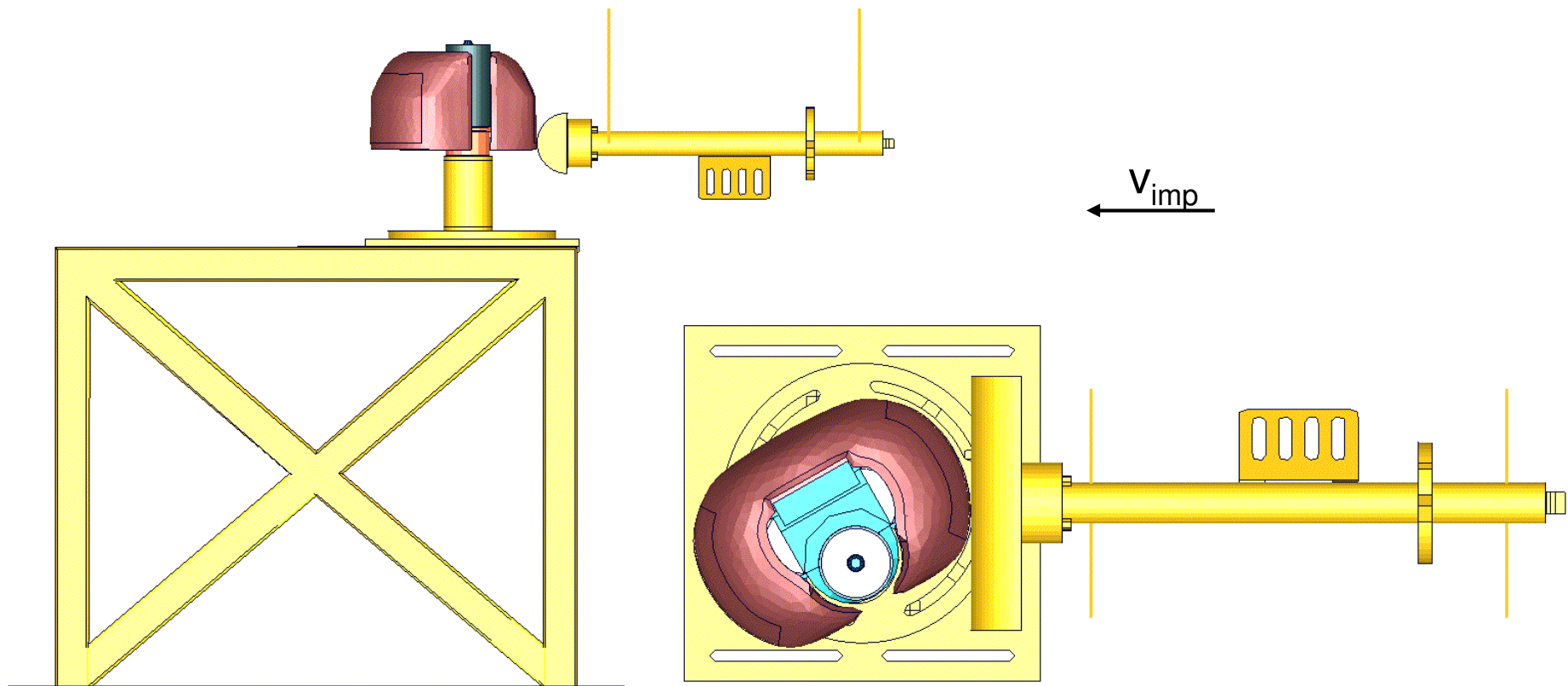
- shoulder foam
- plastic clavicle
- upper/lower arm foam
- arm bone
- rubber lumbar spine
- plastic iliac wing
- pelvis back-plate buffer
- femur stopper



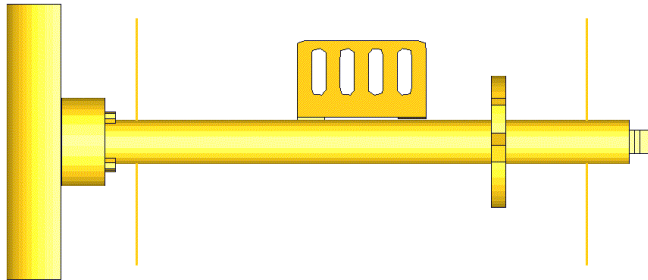
Material tests not finished yet

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Tests on the abdomen with 2 impact heights, 3 angles and 3 velocities are done. For the test the abdomen and all parts of the dummy are used headfirst.



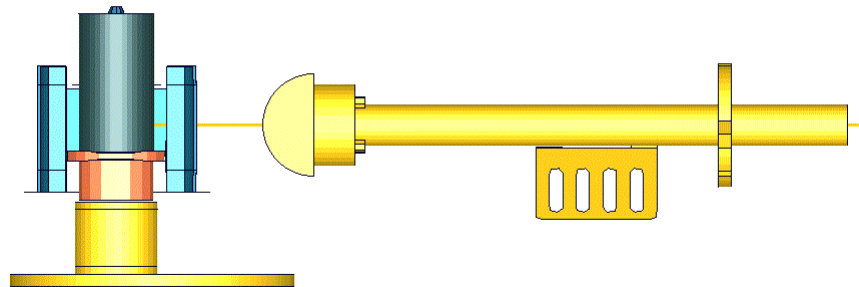
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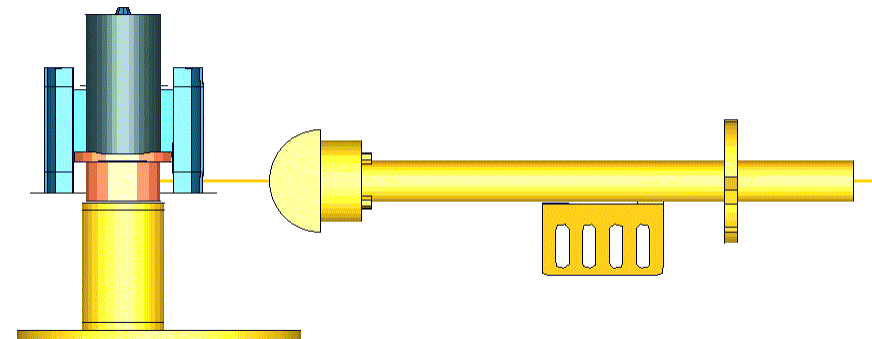
Mass of = 10 kg

Velocity = low / middle / high m/s

2 different abdomen adapter used, to impact the middle and the upper connection of the abdomen load cell for each angle.



Adapter low

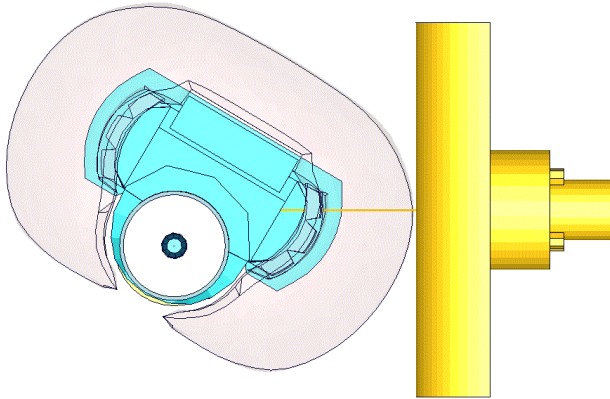


Adapter high

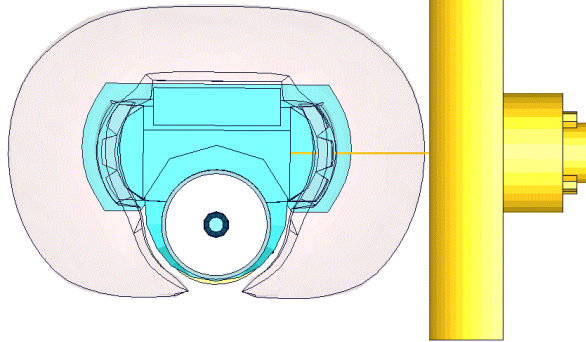
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3 different angles of abdomen for each adapter height and each velocity

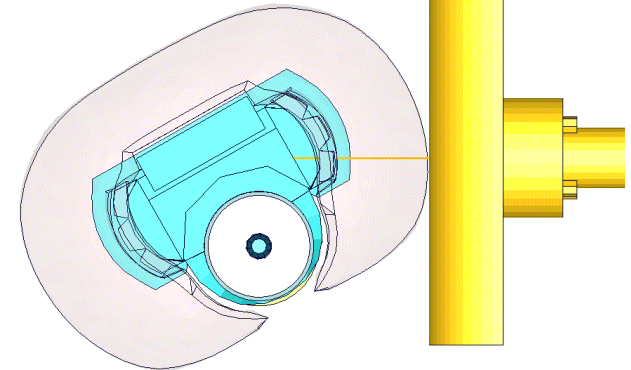
angle of 60 degree:



angle of 90 degree:

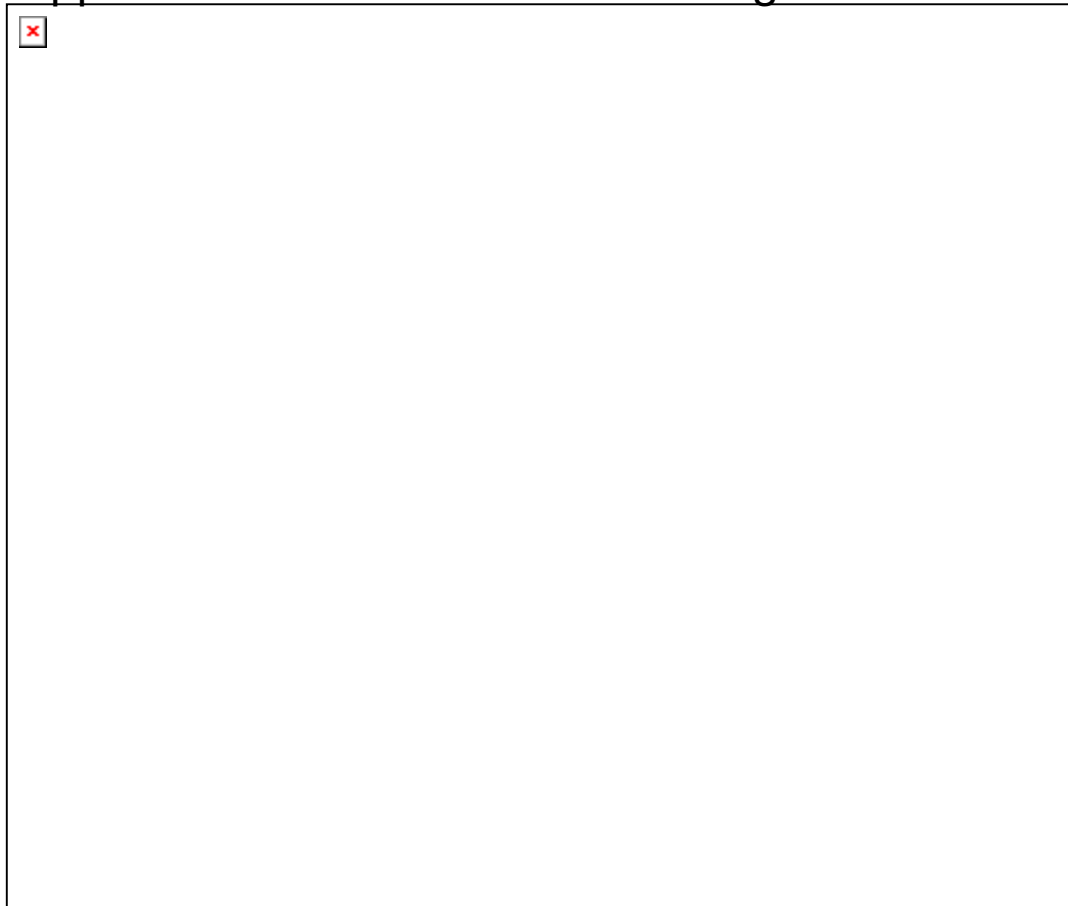


angle of 120 degree:



Basic Setup

- Tests on complete Arm with two velocities, at three locations of the Arm and an additional set of tests with different positions of the middle and bottom supports of the test structure and higher velocities.



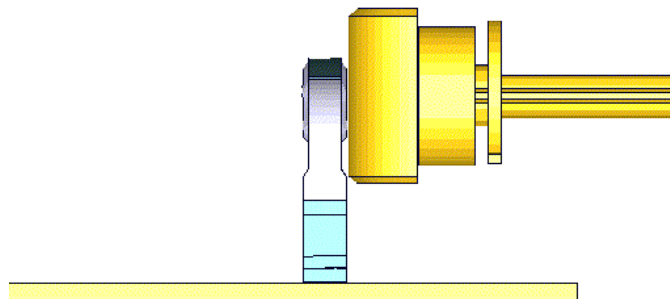
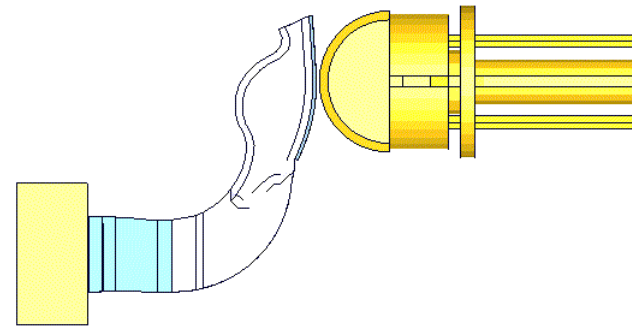
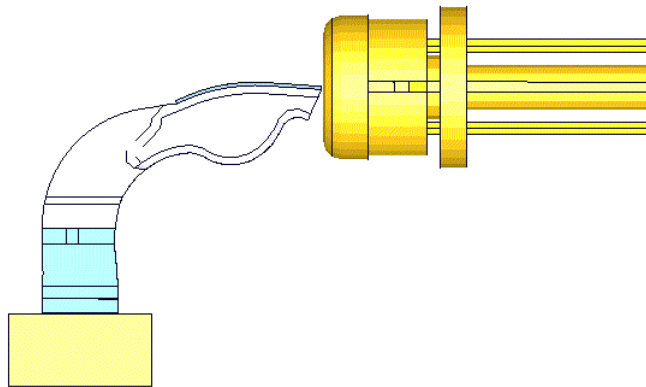
Impact positions:

Z1V[1/2]

Z2V[1/2]

Z3V[1/2]

Impact in three different directions and different velocities



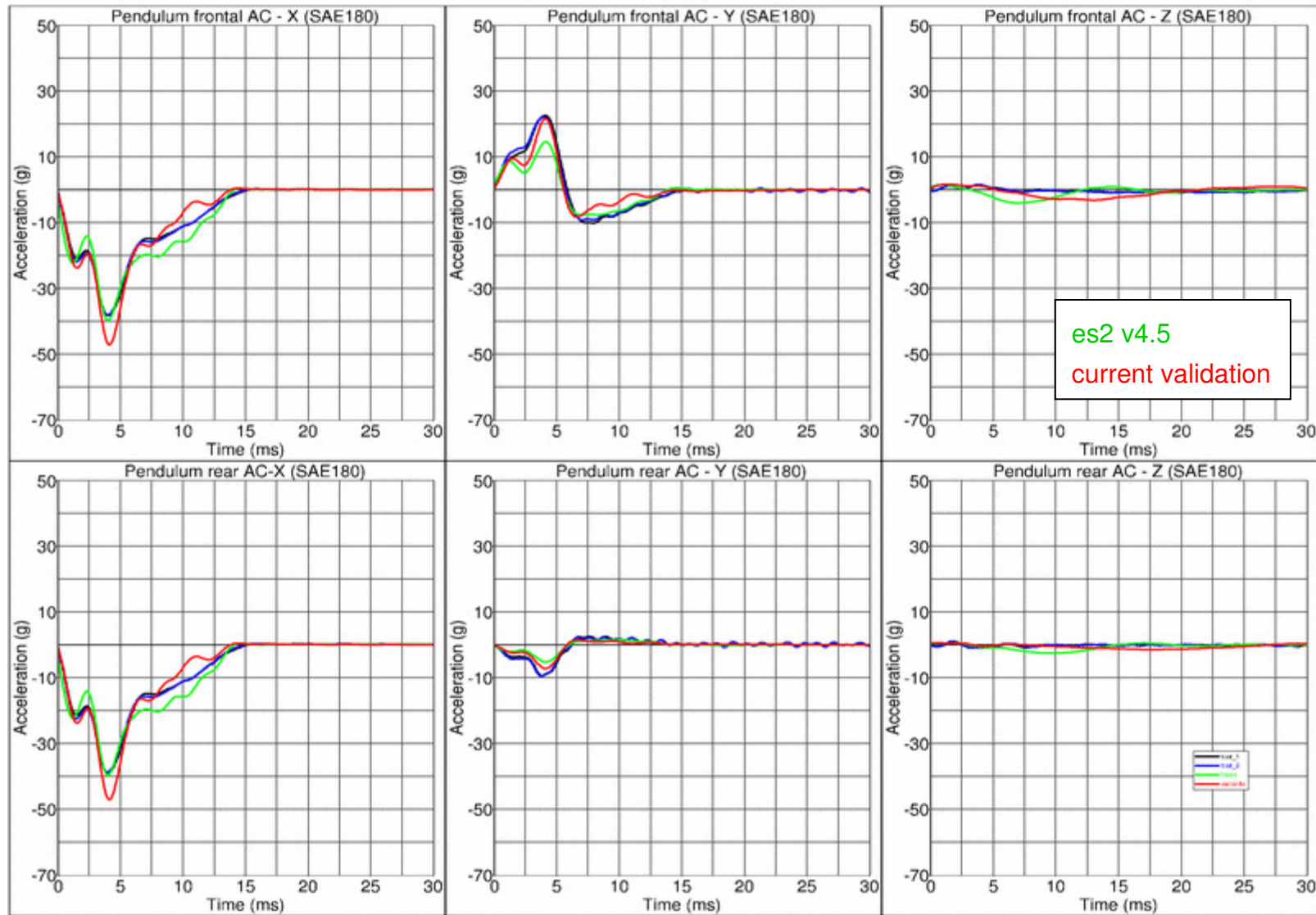
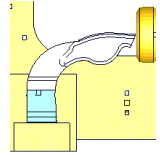
Legend for following test results:

test data: set 1 / set 2 / set 3

basis: es2 v4.5

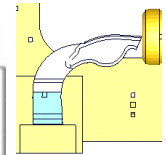
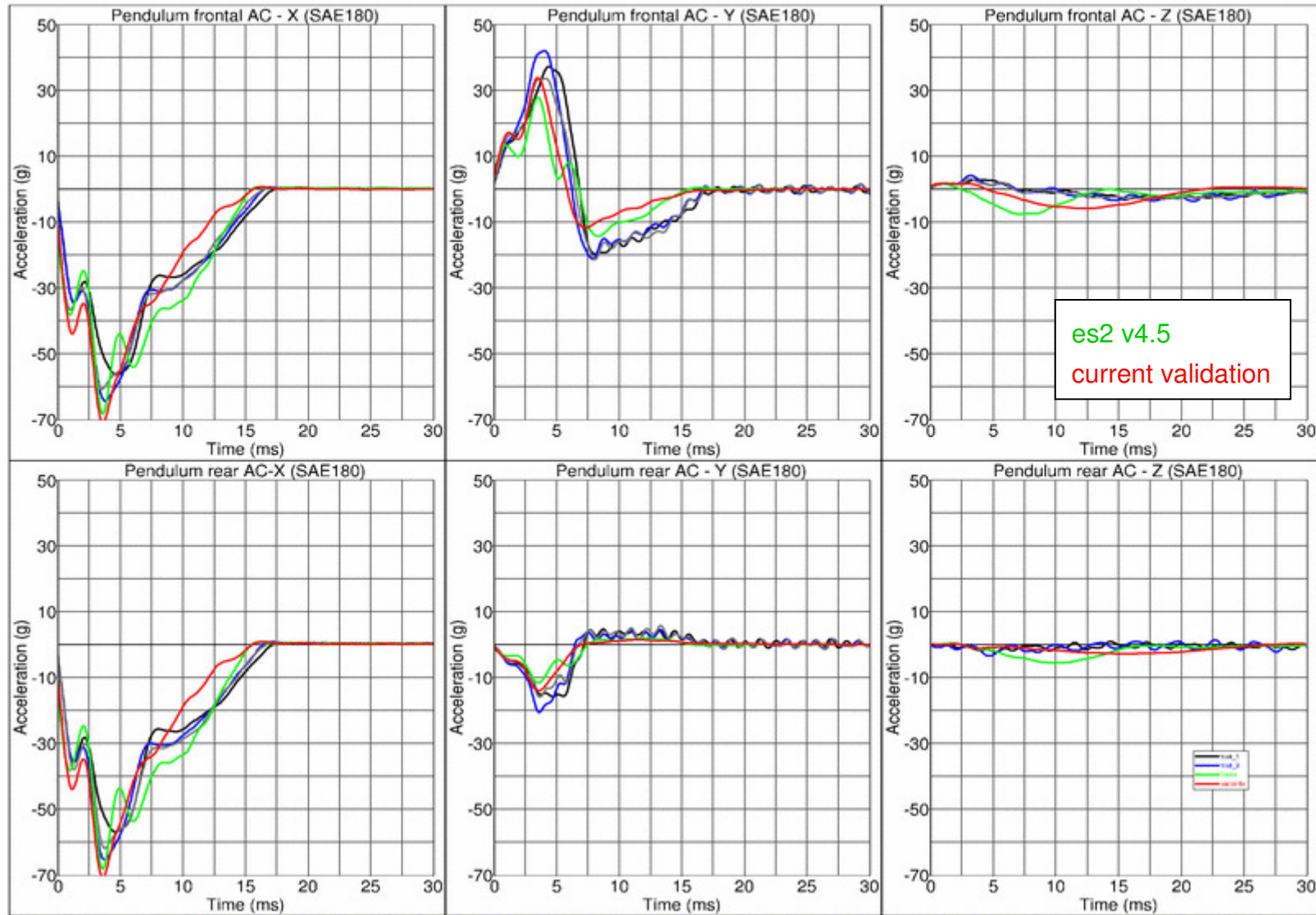
variant: current validation

PDB ES2 /ES2re



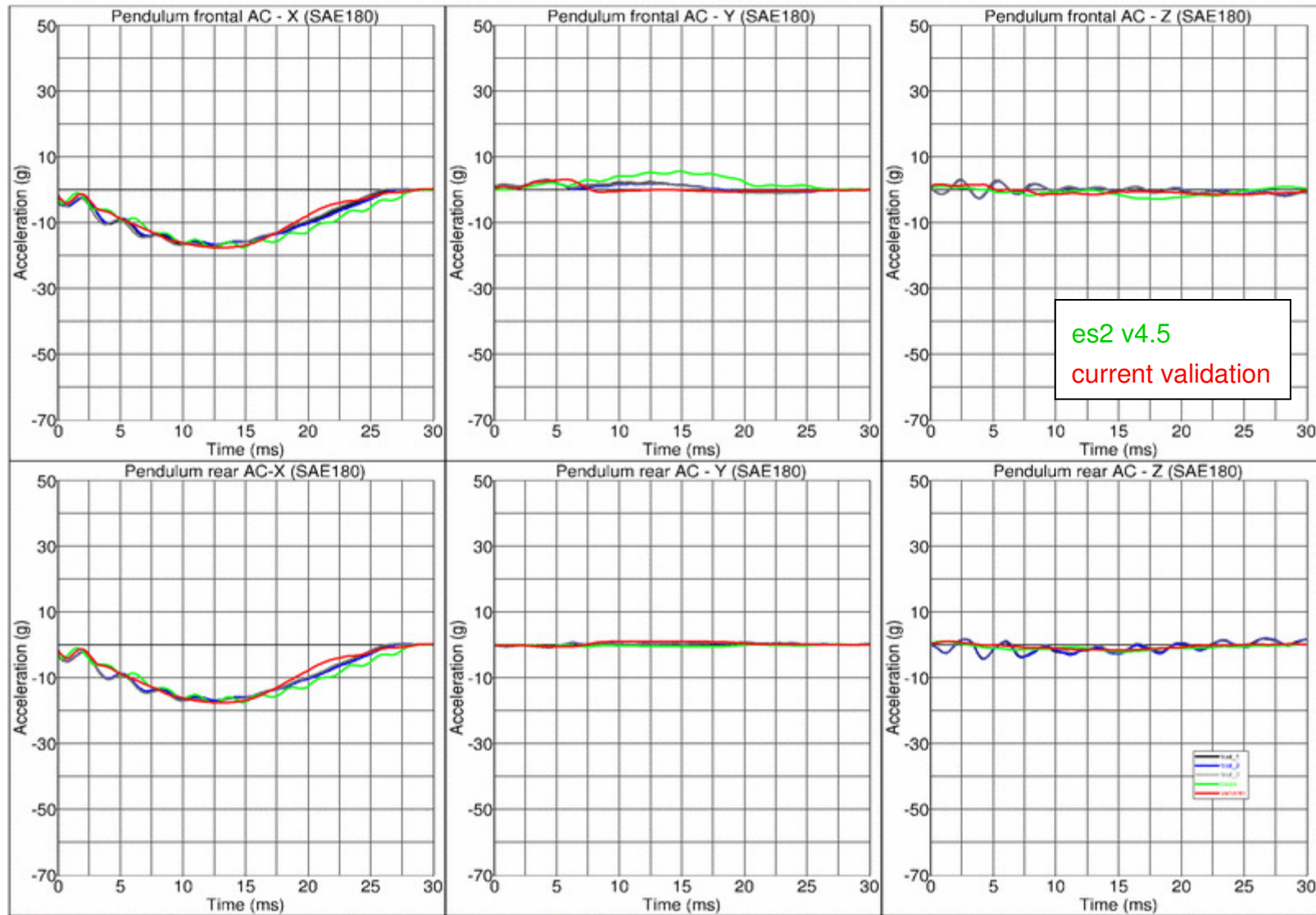
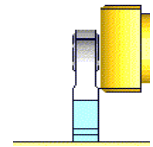
PDB ES2 /ES2re

Clavicletest, x-Richtung, v=3.0m/s

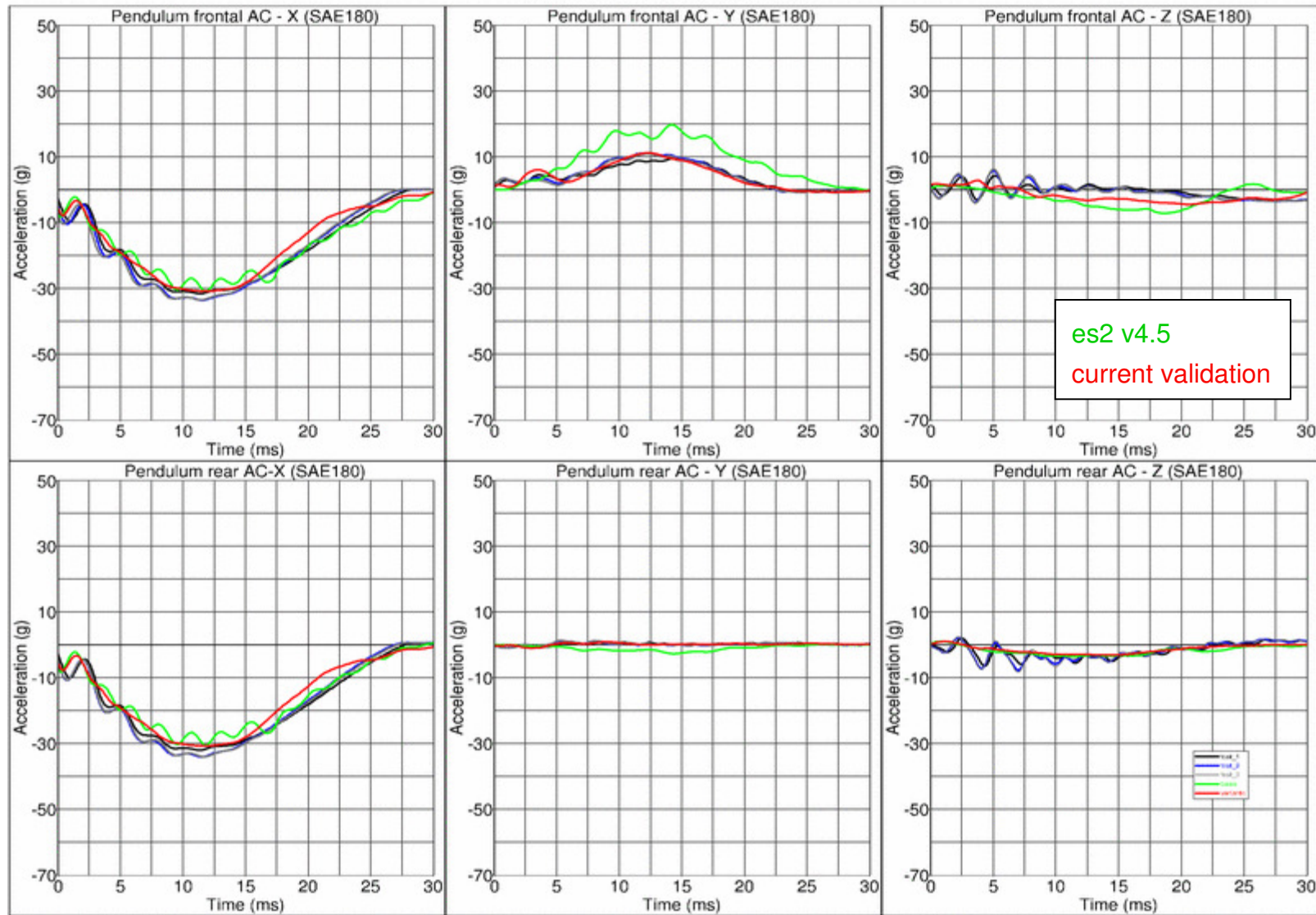
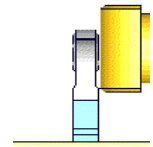


es2 v4.5
current validation

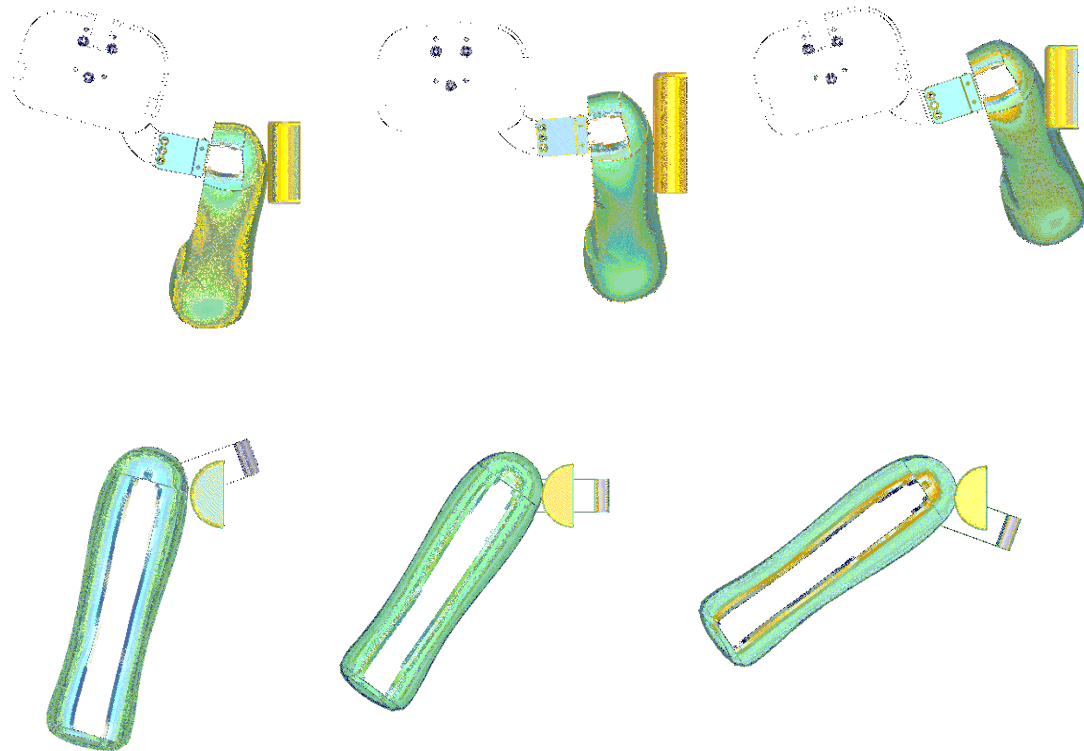
PDB ES2 /ES2re



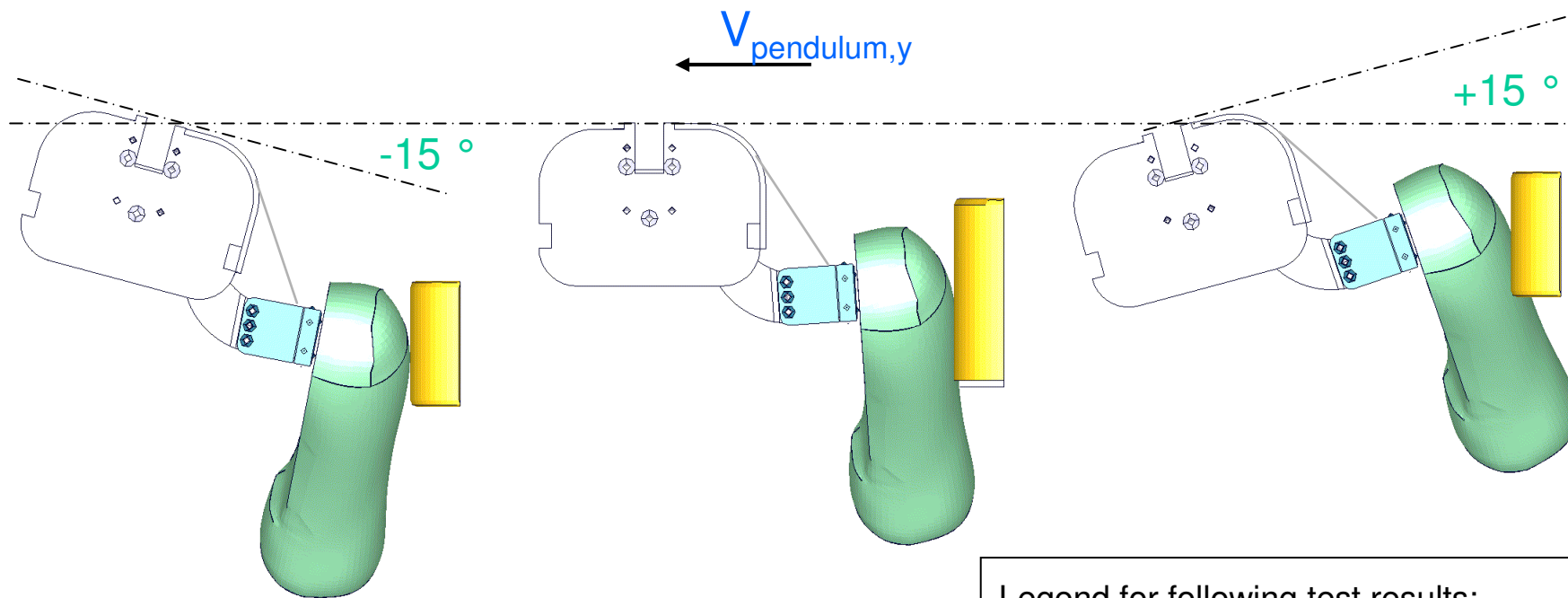
PDB ES2 /ES2re



Impact on the arm, clavicle and clavicle box system in use of different angles and velocities.



Impact on the arm, clavicle and clavicle box system in use of different angles and velocities.

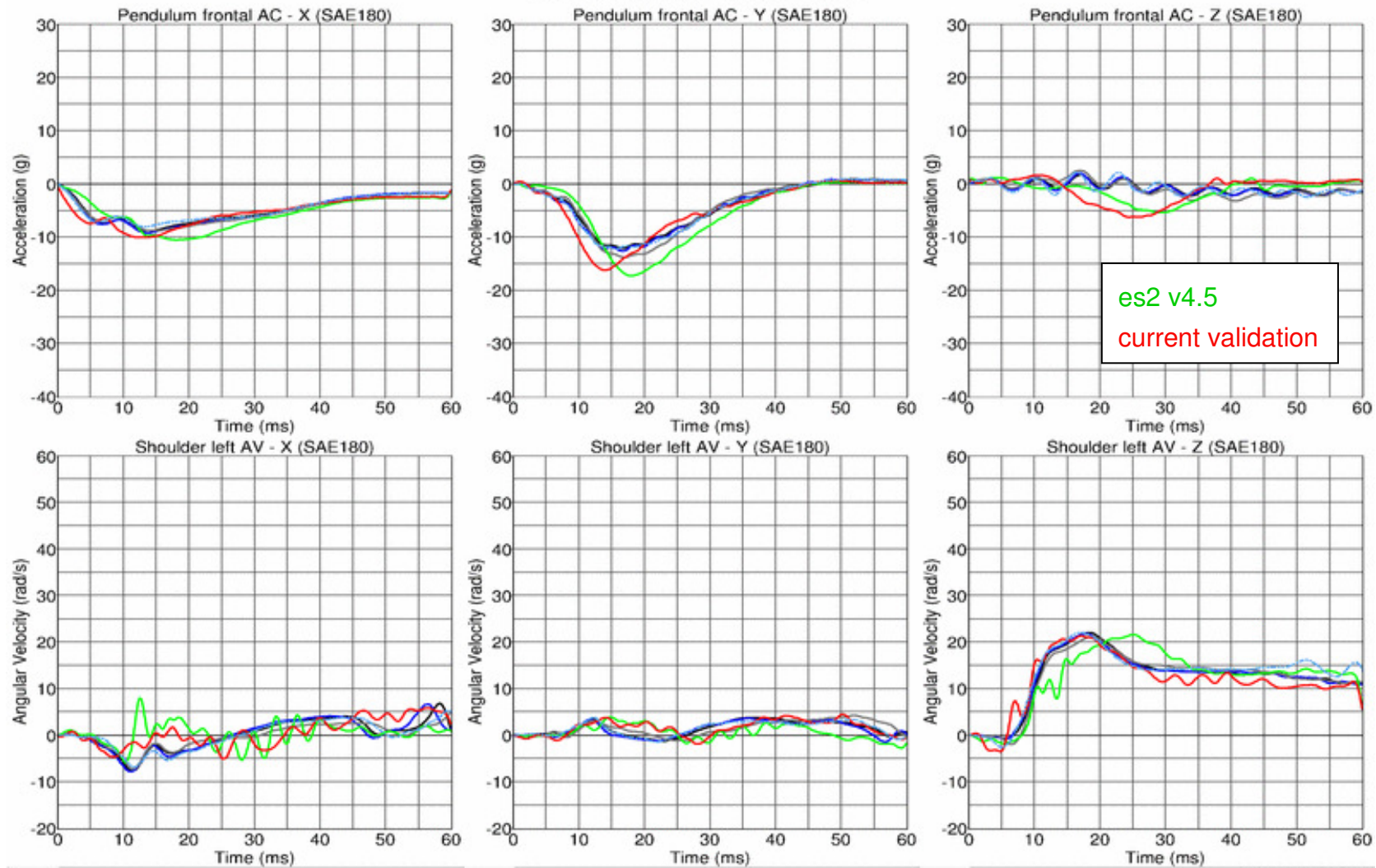
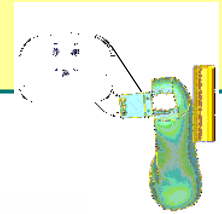


Legend for following test results:

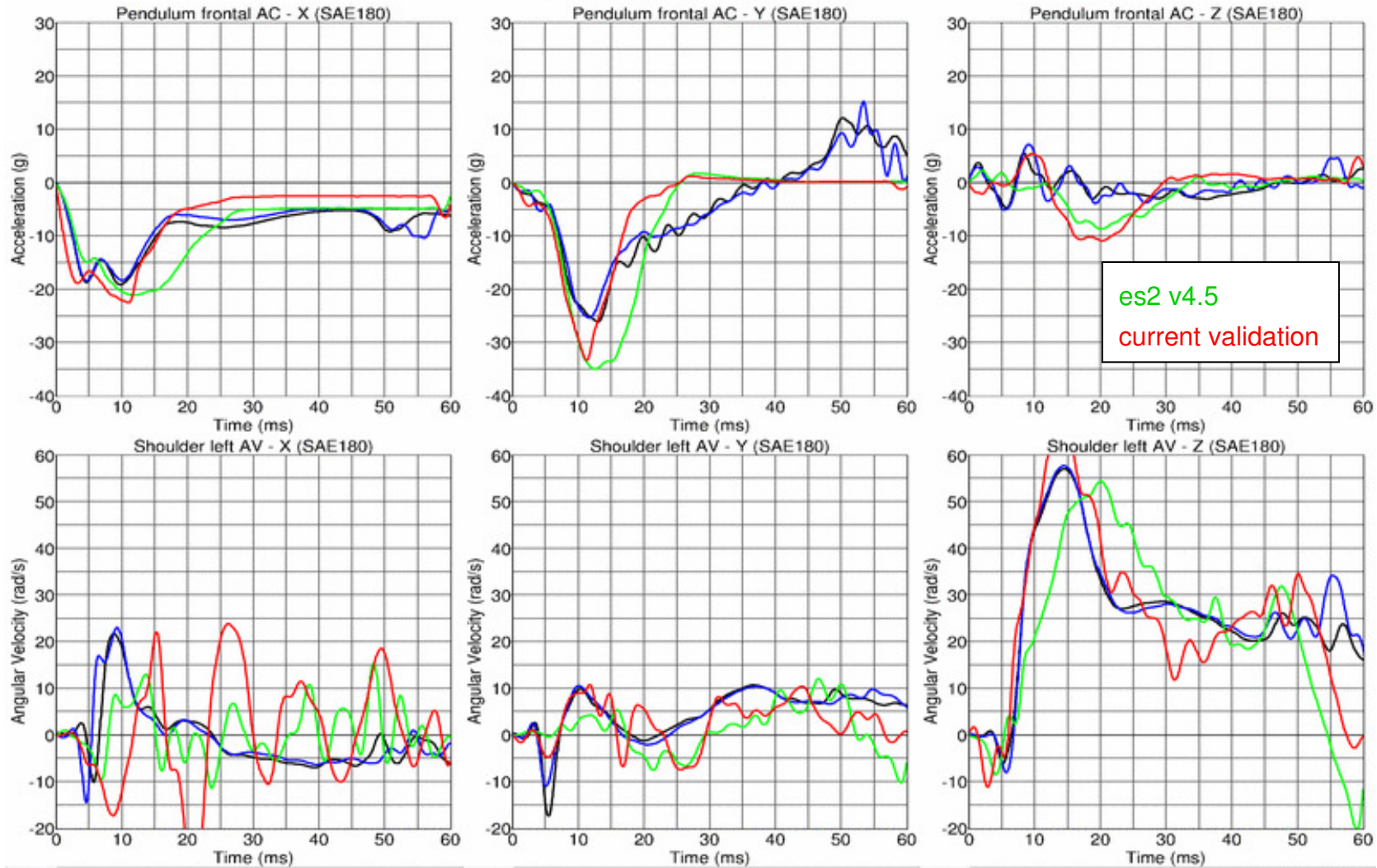
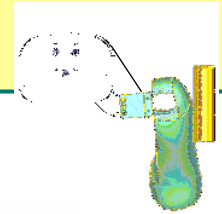
test data: set 1 / set 2 / set 3

basis: es2 v4.5

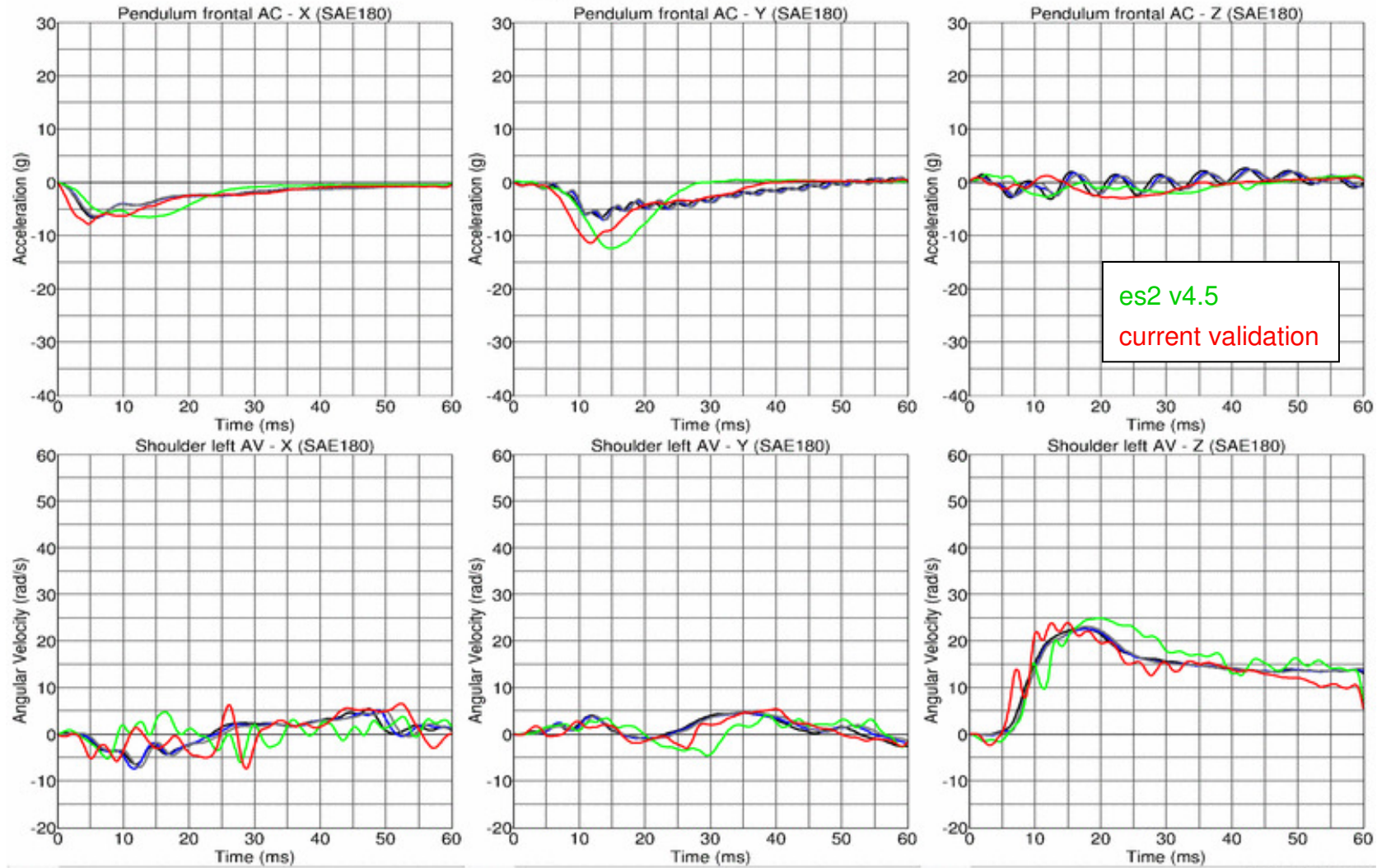
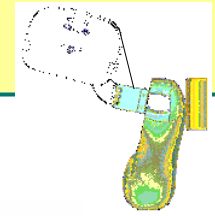
variant: current validation



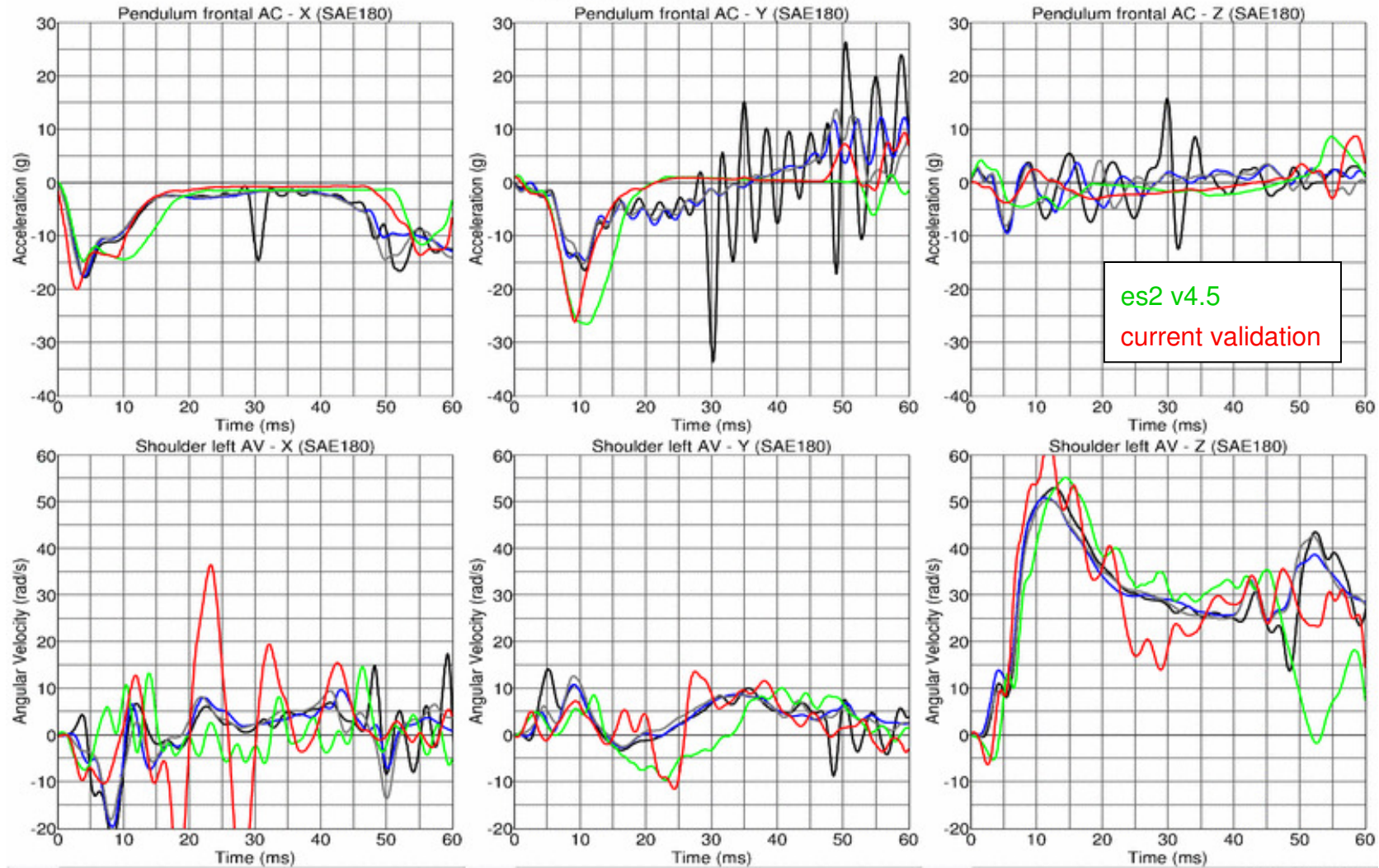
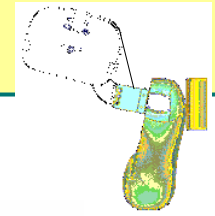
Jens Zschieschack - DYNAmore
2009-10-07



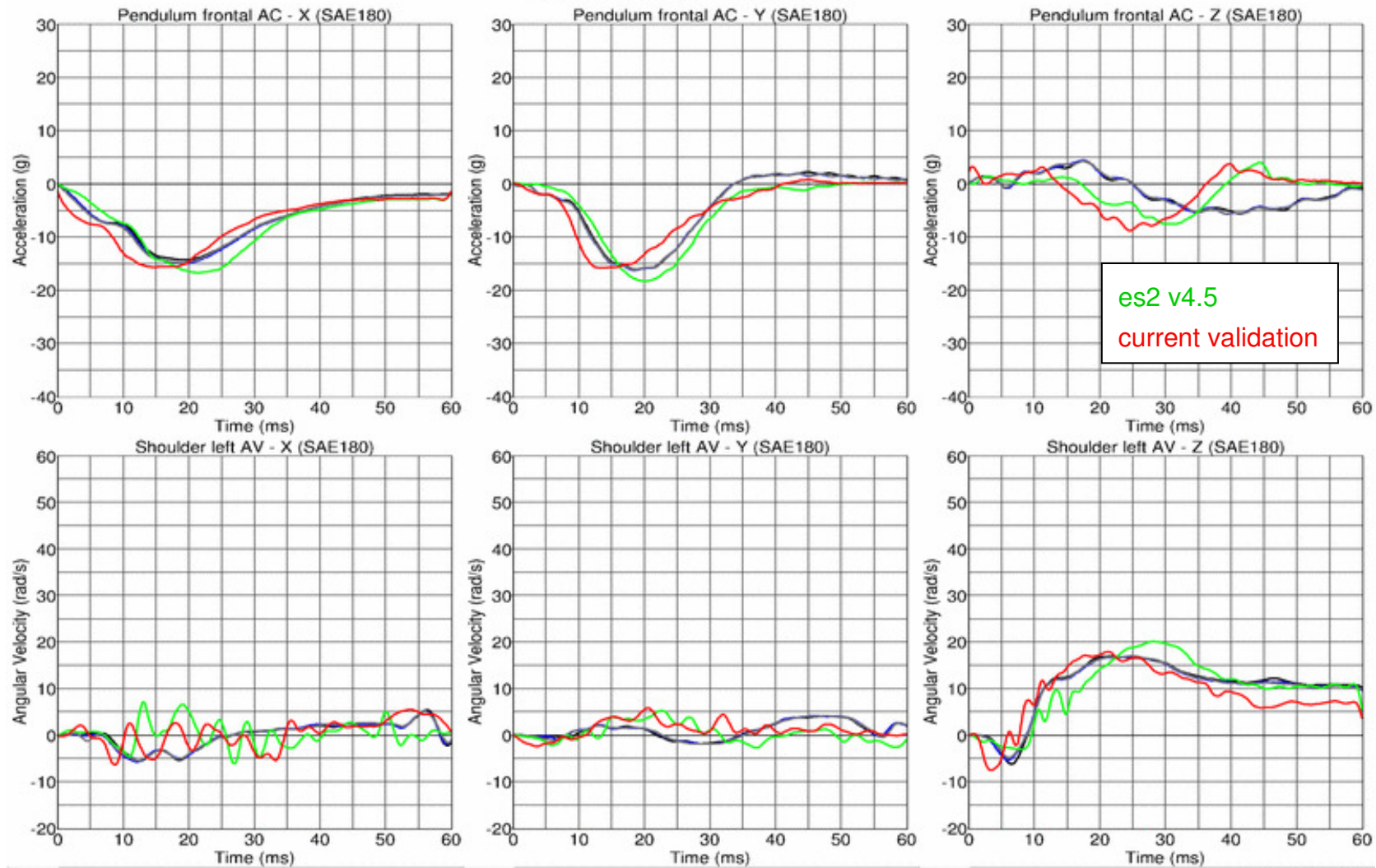
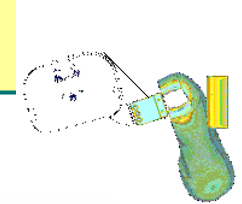
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2009-10-07



Jens Zschieschack - DYNAmore
2009-10-07

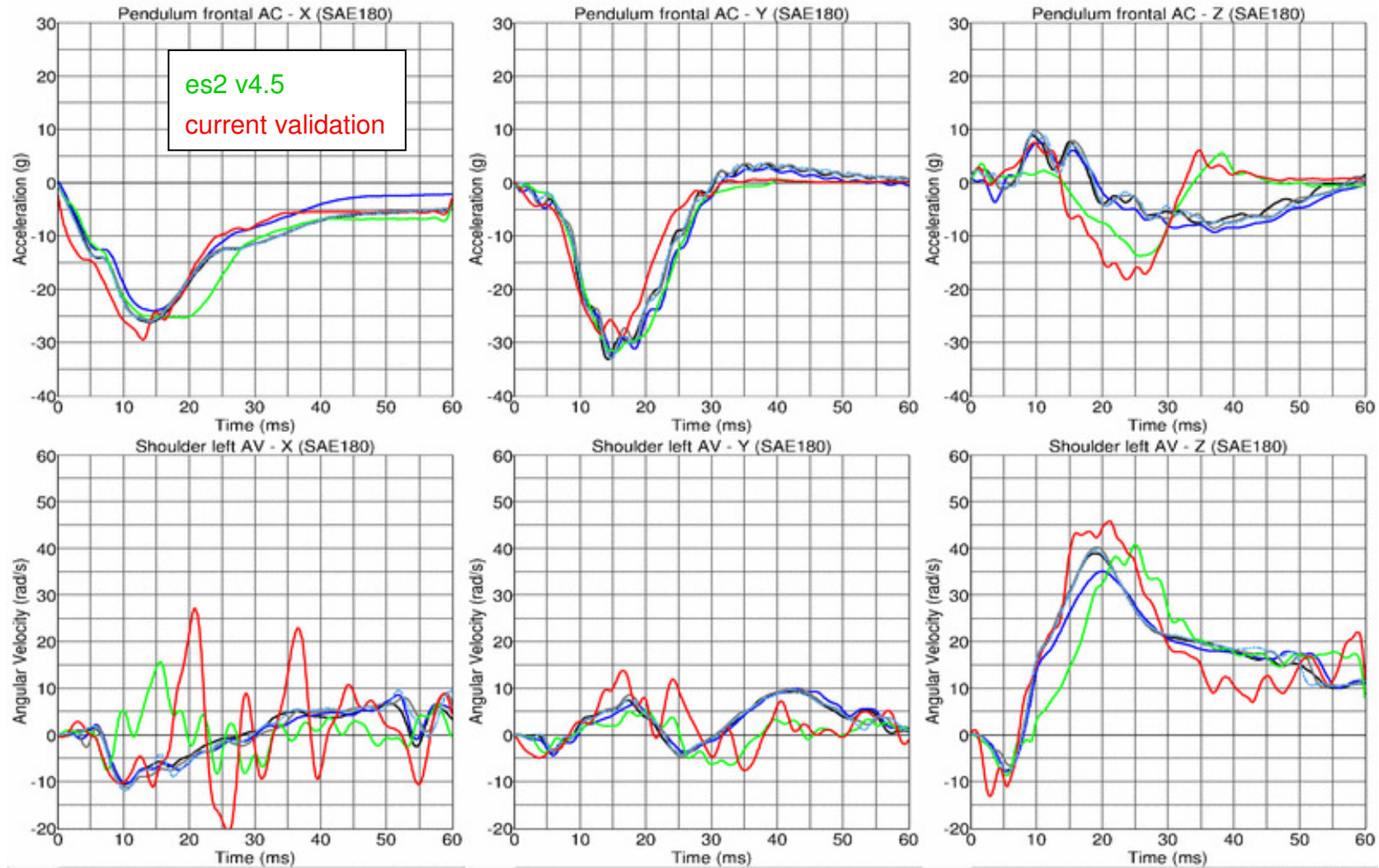
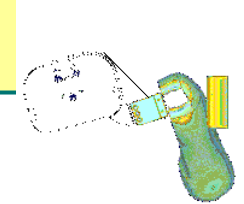


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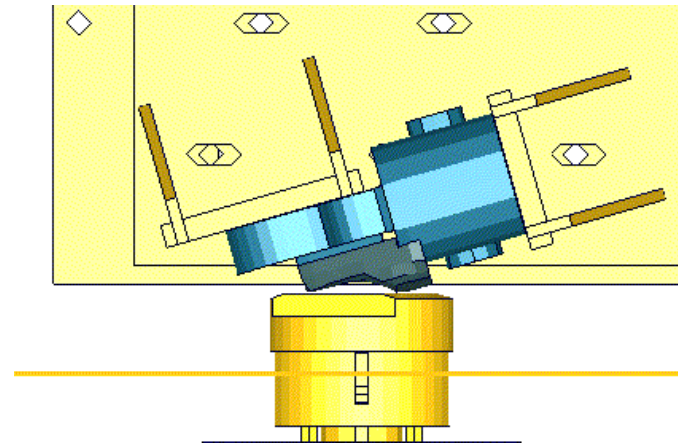
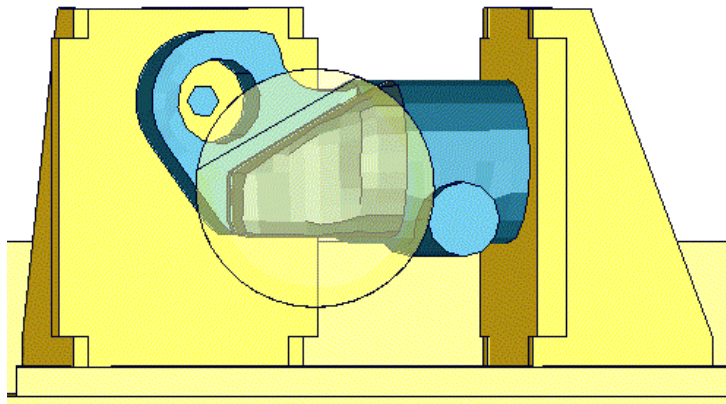
PDB ES2 /ES2re



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PDB ES2 /ES2re

Tests on a fixed femur stopper at one location with 2 different velocities.



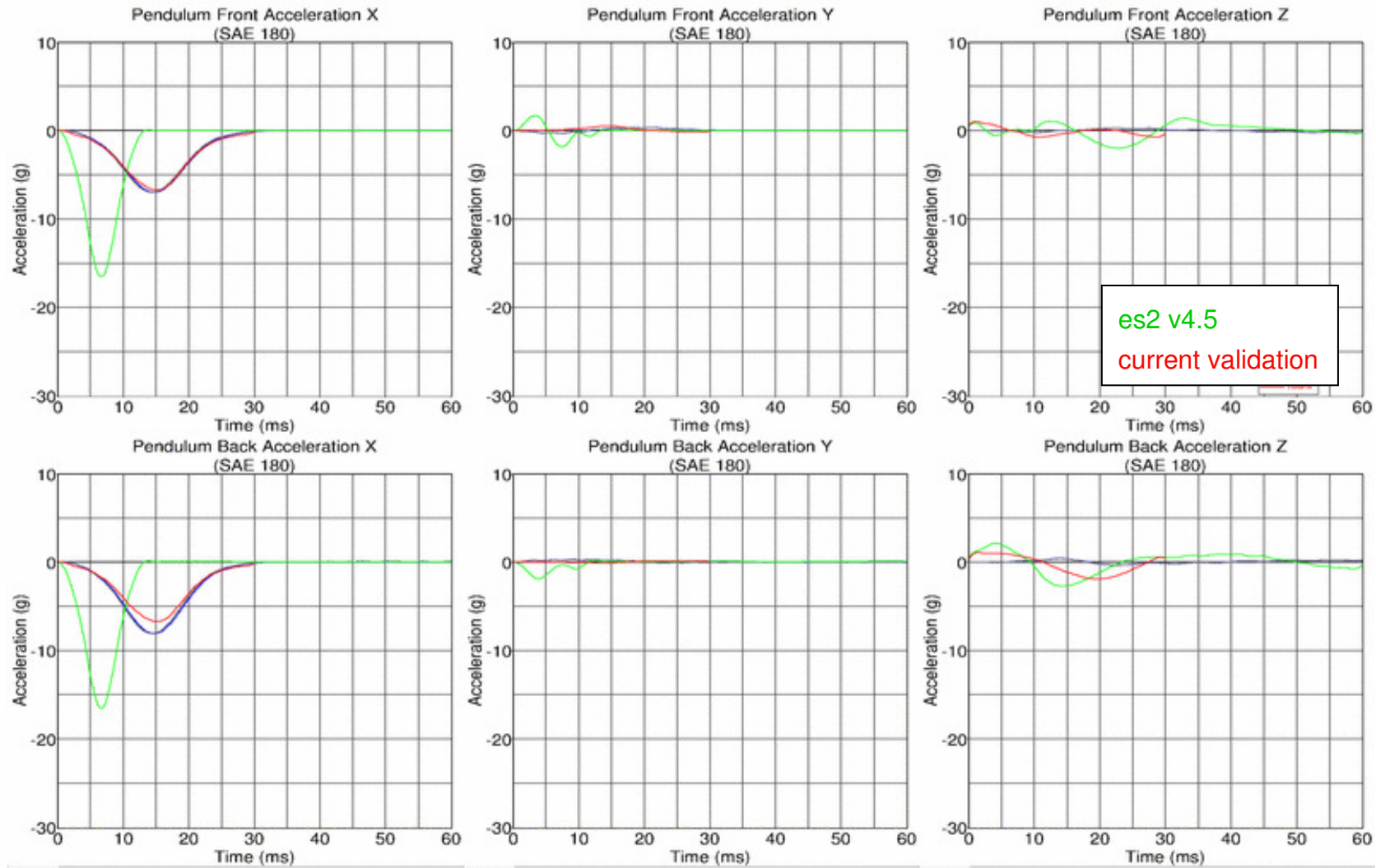
Legend for following test results:

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basis: es2 v4.5

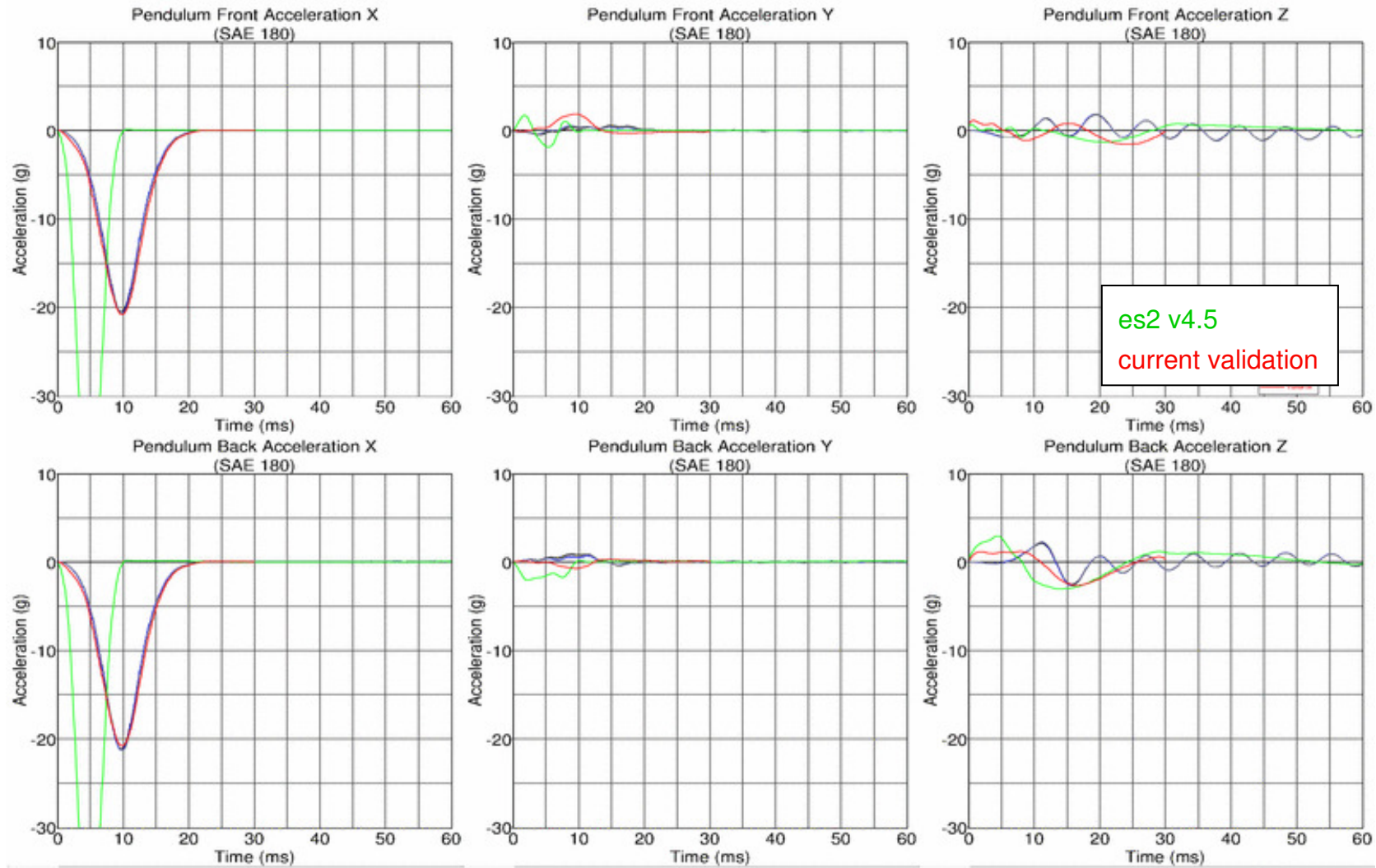
variant: current validation

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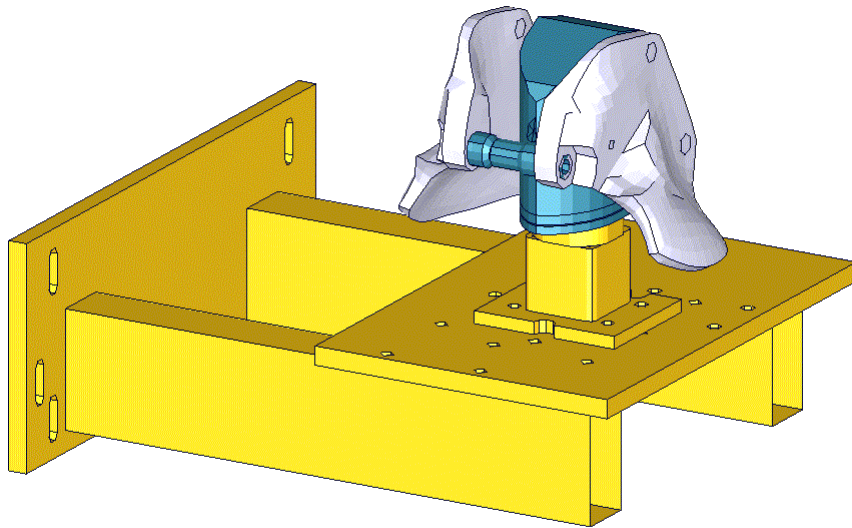
PDB ES2 /ES2re



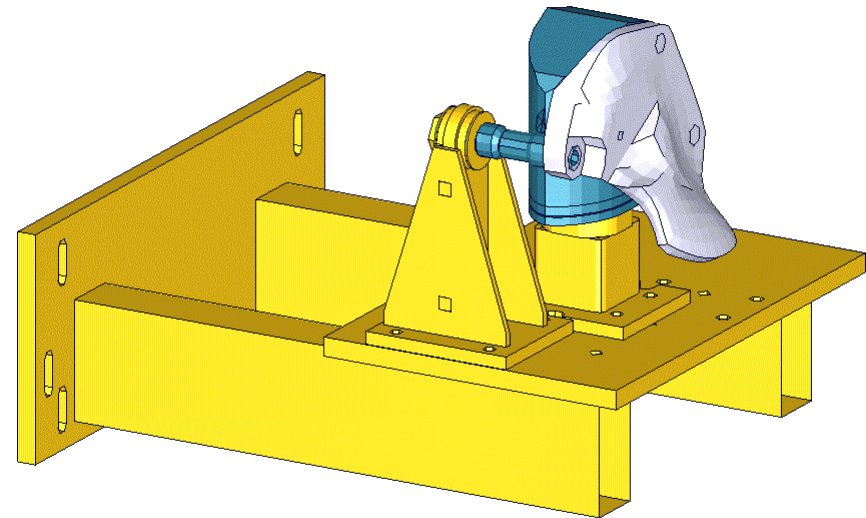
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2009-08-17

Basic Setup

- Tests are carried out with the Iliac wings in 2 different boundary conditions:
 - + Constraint at the Sacrum block, *with both Iliac wings*
 - + Constraint at the Sacrum block and at the load cell on the Pubic bone, *with one Iliac wing and additional fixture*

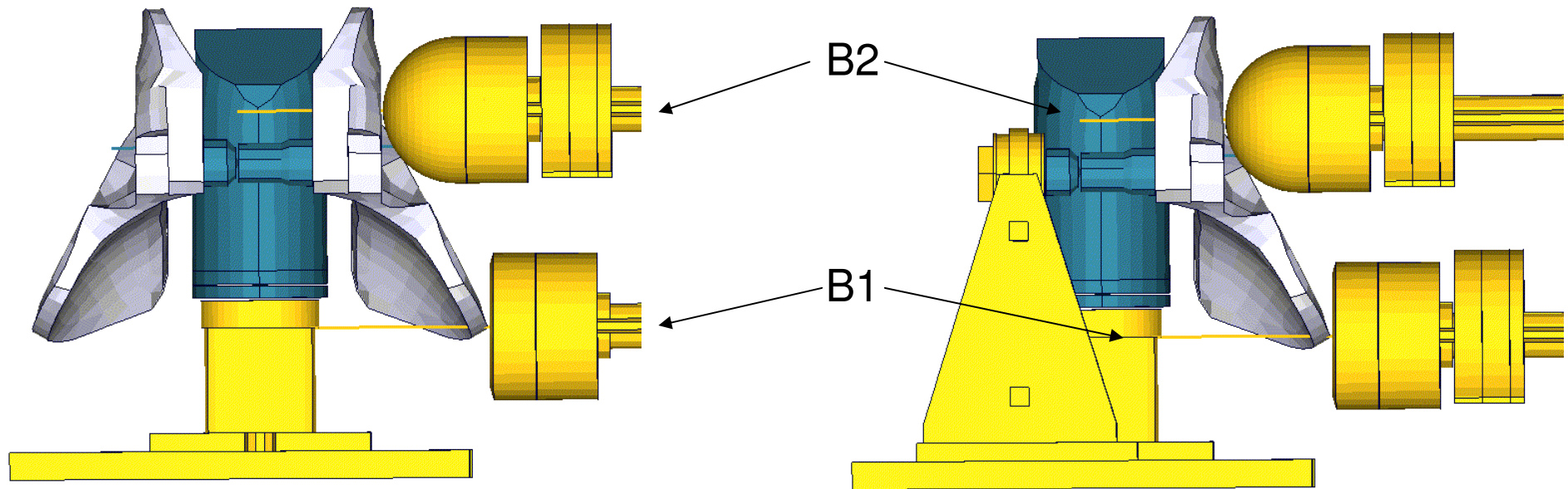


Loadcase F1



Loadcase F2

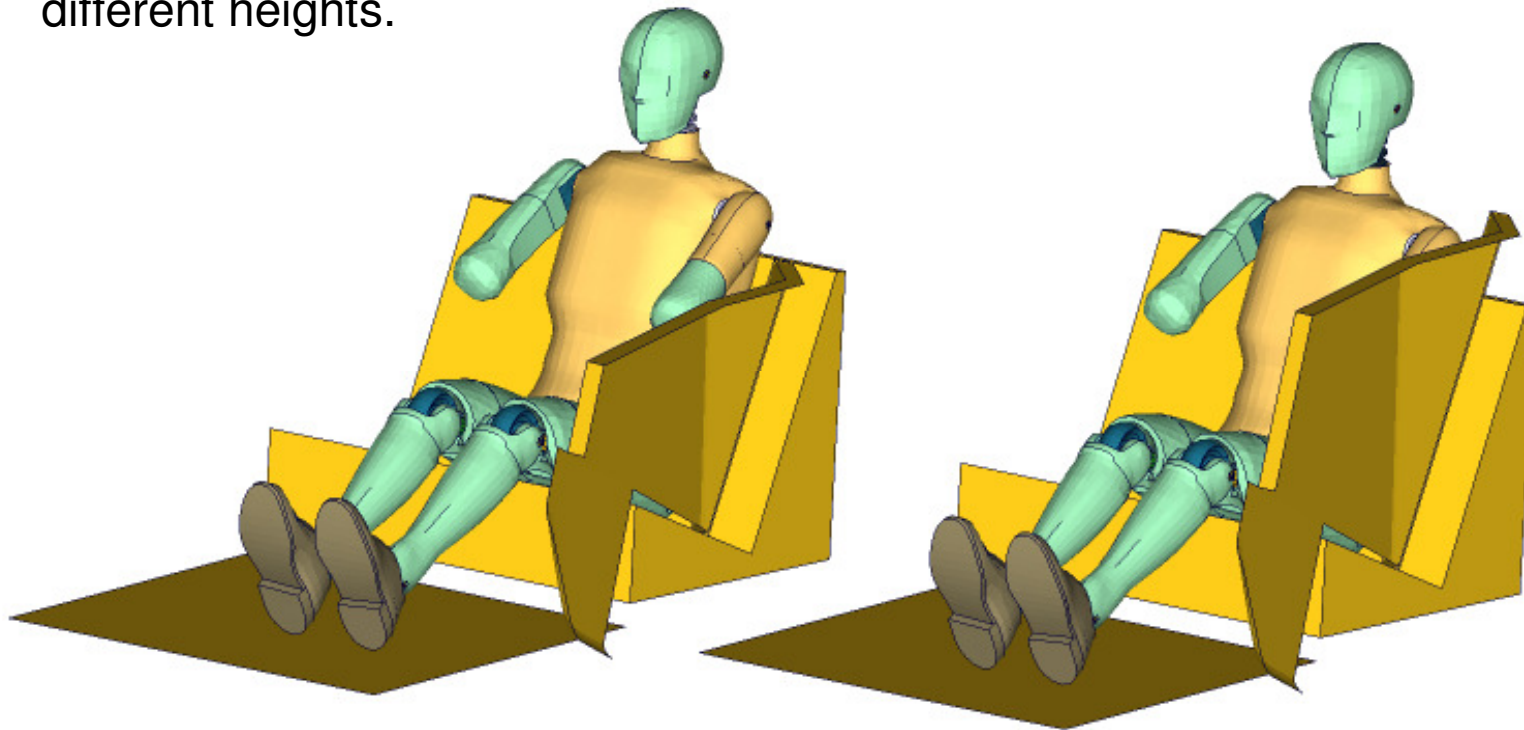
- For each load-case F1 & F2 are 2 impact positions, each with a different pendulum head. The pendulums in turn have 2 velocities at each position.



Loadcase F1

Loadcase F2

- There are done additional sled test with the es2re and the standard sled shapes.
- New shapes for the sleds are used which are similar to deformations of a door trim in an FMVSS 214 oblique pole test. The so called curved barrier is used then in two different heights.



PDB ES2 /ES2re

- Small update v4.5 available.
- Large update (v5.0) including all component tests and available sled tests
→ Available August of 2010.
- Update (v6.0) including all sled tests and curved barrier tests (similar to FMVSS 214 deformations)
→ available beginning of 2011

