



H-HOM antenna transport evaluation

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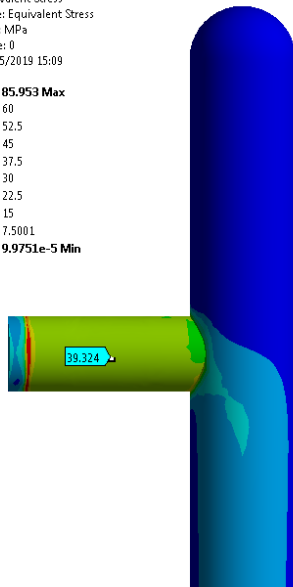
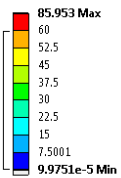
Introduction and previous results

- Shock response show large stress in the connection between the hook and the Nb can.
- The stress were high both in the perpendicular and parallel directions to the hook.

Mode	f [Hz]
1	65
2	69
3	338
4	349
5	424

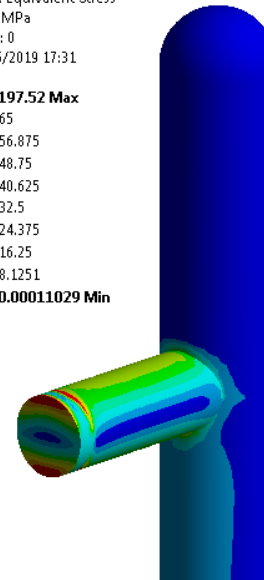
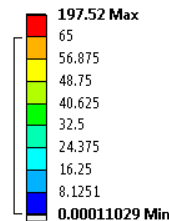
Perpendicular to the hook

P: Response Spectrum
Equivalent Stress
Type: Equivalent Stress
Unit: MPa
Time: 0
24/05/2019 15:09

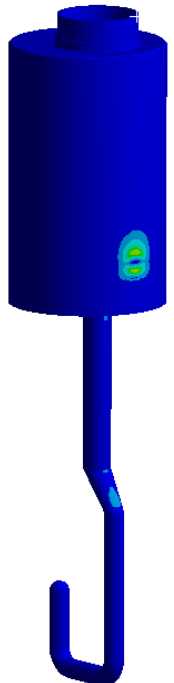
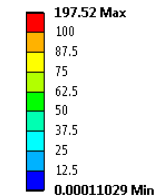


Parallel to the hook

P: Response Spectrum
Equivalent Stress
Type: Equivalent Stress
Unit: MPa
Time: 0
24/05/2019 17:31



P: Response Spectrum
Equivalent Stress
Type: Equivalent Stress
Unit: MPa
Time: 0
24/05/2019 18:00



What is the permanent deformation after this shock?

Transient analysis

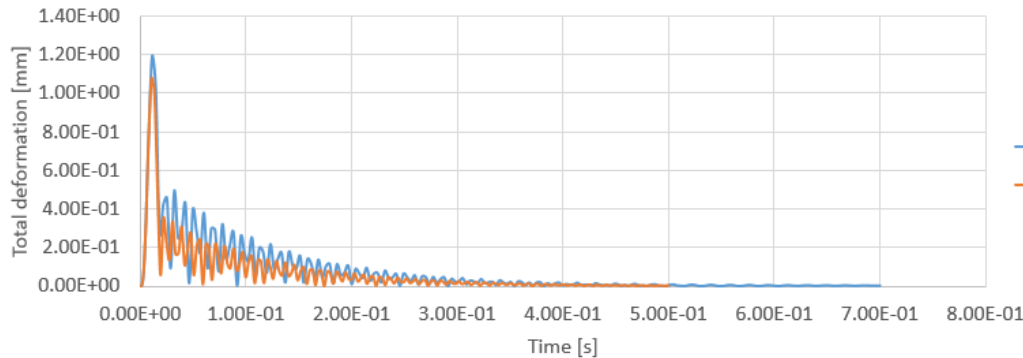
- Transient calculation of a 10g, 20 ms shock.
- Damping ratio of 2 %
- Two material models:
 - Elastic perfectly-plastic with 65 MPa yield
 - Bilinear kinematic hardening
- Shock parallel and perpendicular to the antenna.

1. Which direction is worse in terms of permanent deformation?

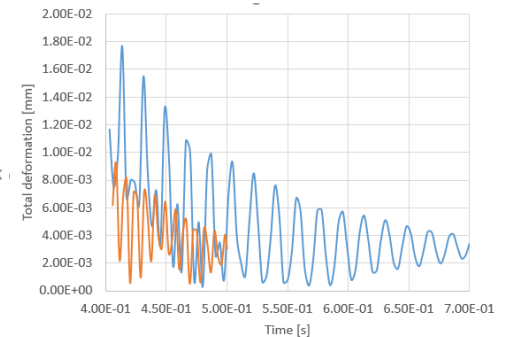
2. What is the effect of the material model?

Transient analysis - Direction

- Permanent deformation stabilizes after ~ 0.7 s.
- Nevertheless, looking around 0.5 s, one can see that the **deformation is larger in the parallel shock**
- **Permanent deformations in the order of microns!**

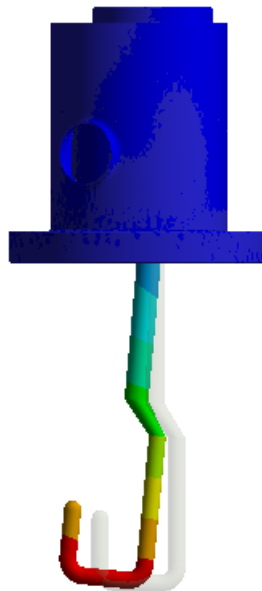
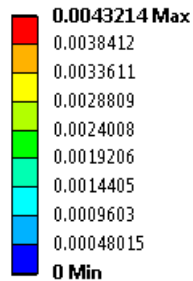


0.4 to 0.5 s interval



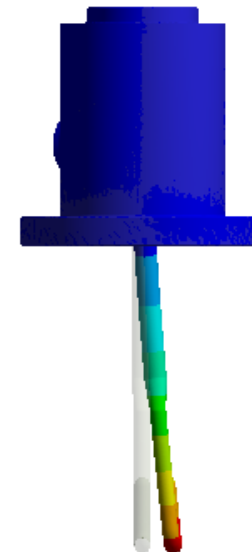
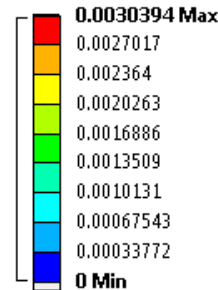
D: Paralell - Transient Hardening

Total Deformation
Type: Total Deformation
Unit: mm
Time: 0.5
21/08/2019 11:16



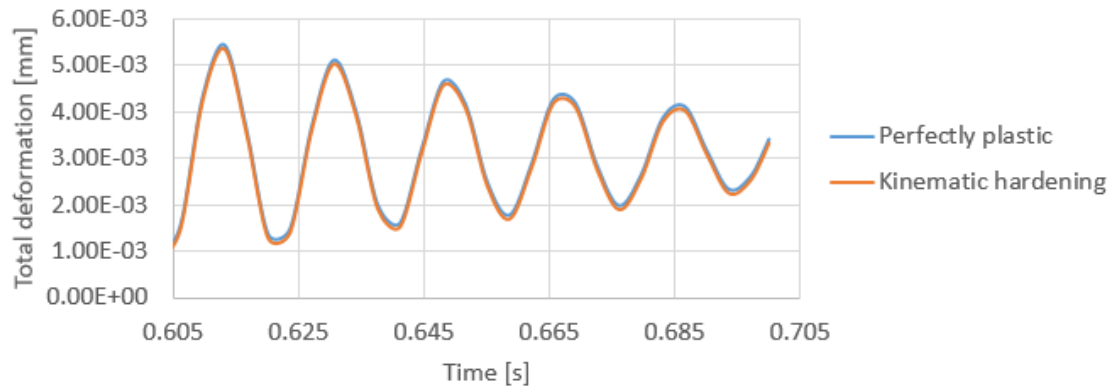
F: Perpendicular - Transient perfectly plastic

Total Deformation
Type: Total Deformation
Unit: mm
Time: 0.5
21/08/2019 11:13



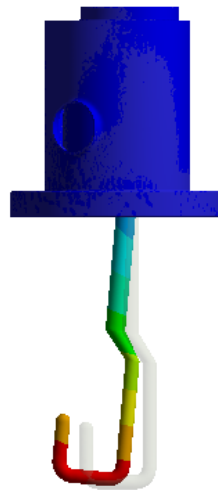
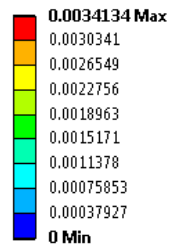
Transient analysis – Material model

- Very small difference between the two material models
- Perfectly plastic is slightly more conservative



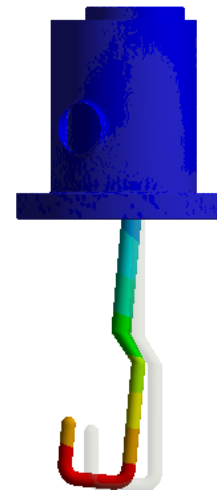
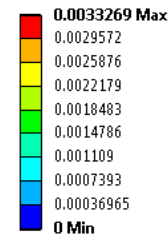
C: Parallel - Transient perfectly plastic

Total Deformation
Type: Total Deformation
Unit: mm
Time: 0.7
21/08/2019 11:21



D: Paralell - Transient Hardening

Total Deformation
Type: Total Deformation
Unit: mm
Time: 0.7
21/08/2019 12:03





Thank you for your attention!

