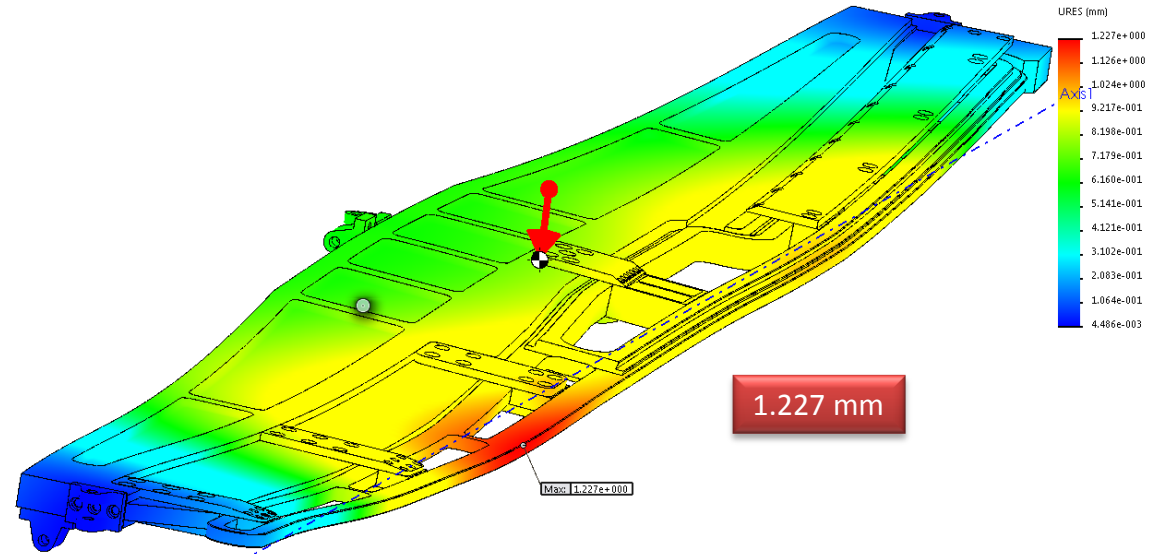
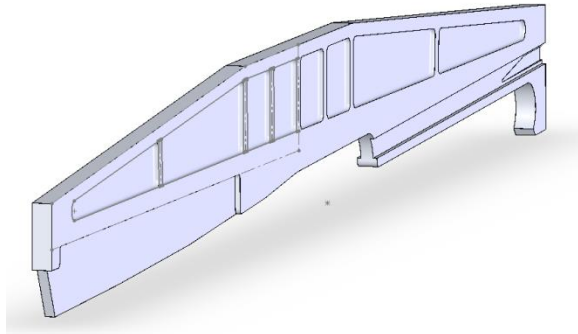


Moller 2013-12-13

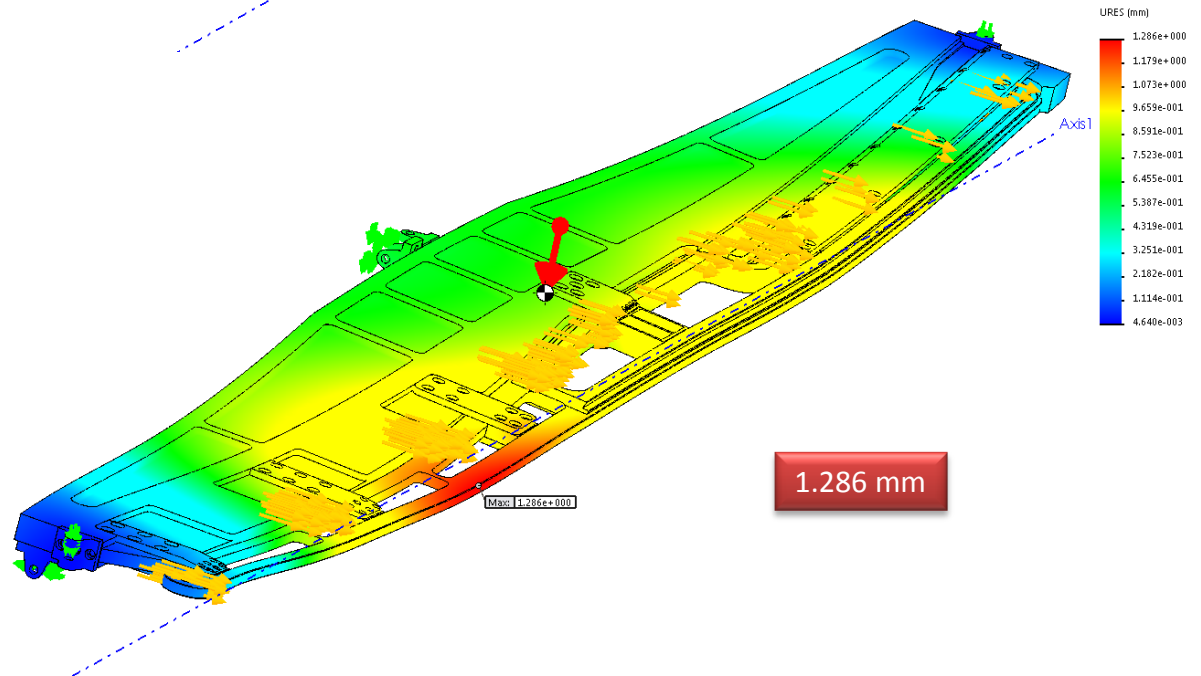
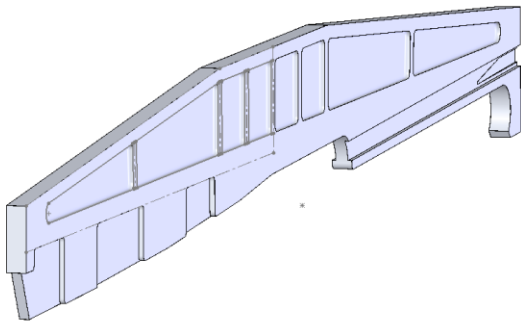
J. Bessuille

# Further changes to carrier, analyzed as an assembly

**Nov 7 (R5)** Further modified Carrier, removed unnecessary material, made narrower and more machinable. Struts now mounted to brackets.

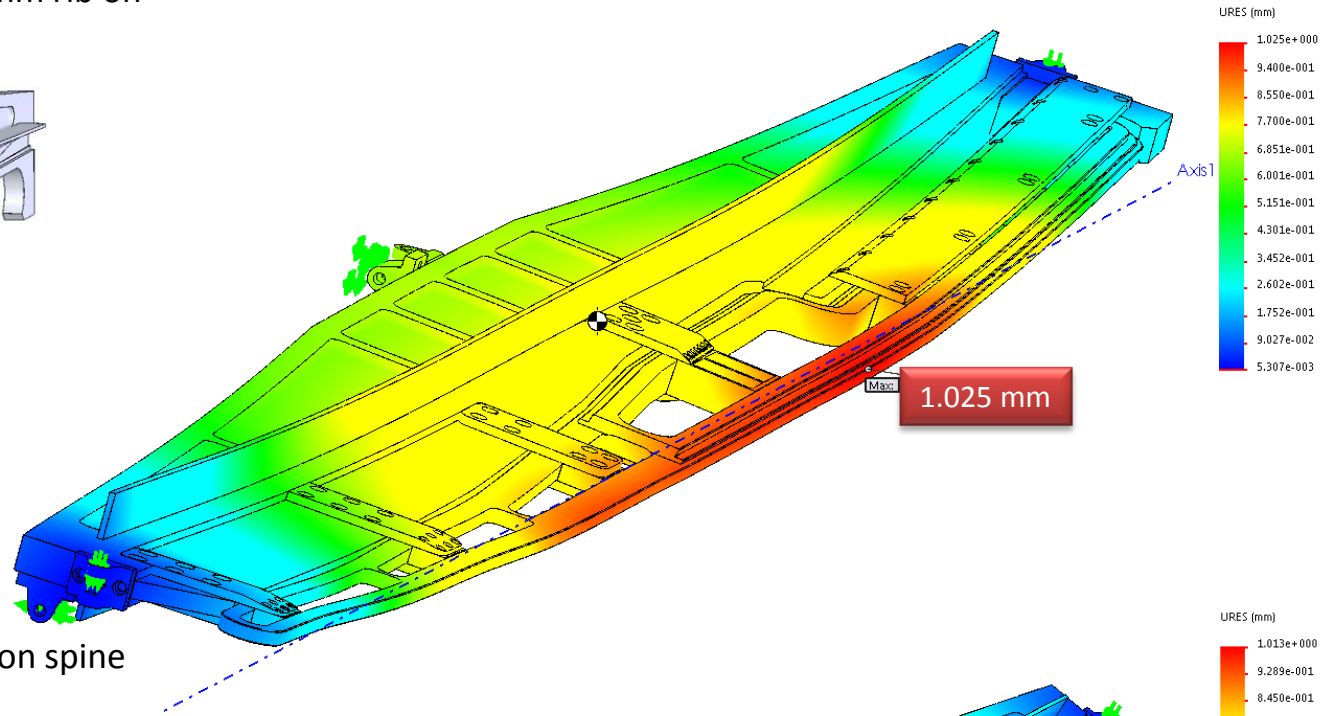
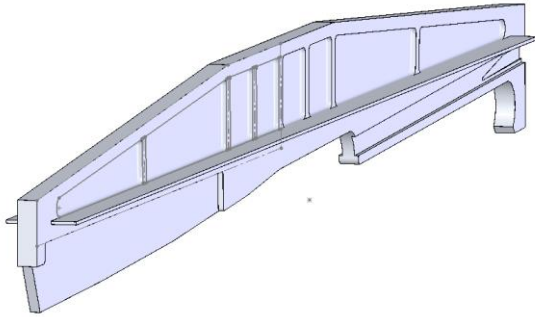


**Nov 7 (R6)** Added material at us end between clamping plates □ deflection gets worse.

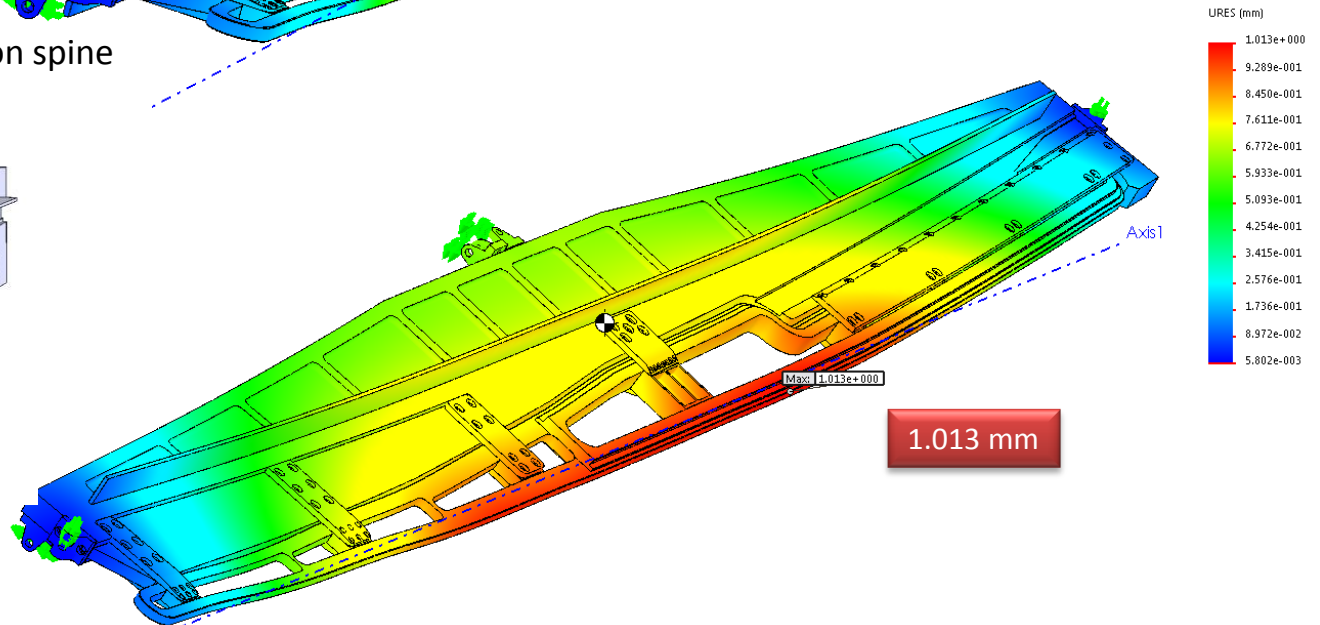
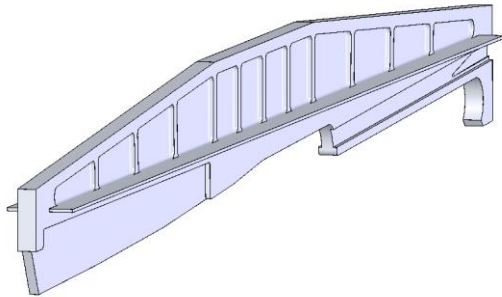


# Further changes to carrier, analyzed as an assembly

**Nov 7 (R7)** Added 12.7 x 100 mm rib on both side faces

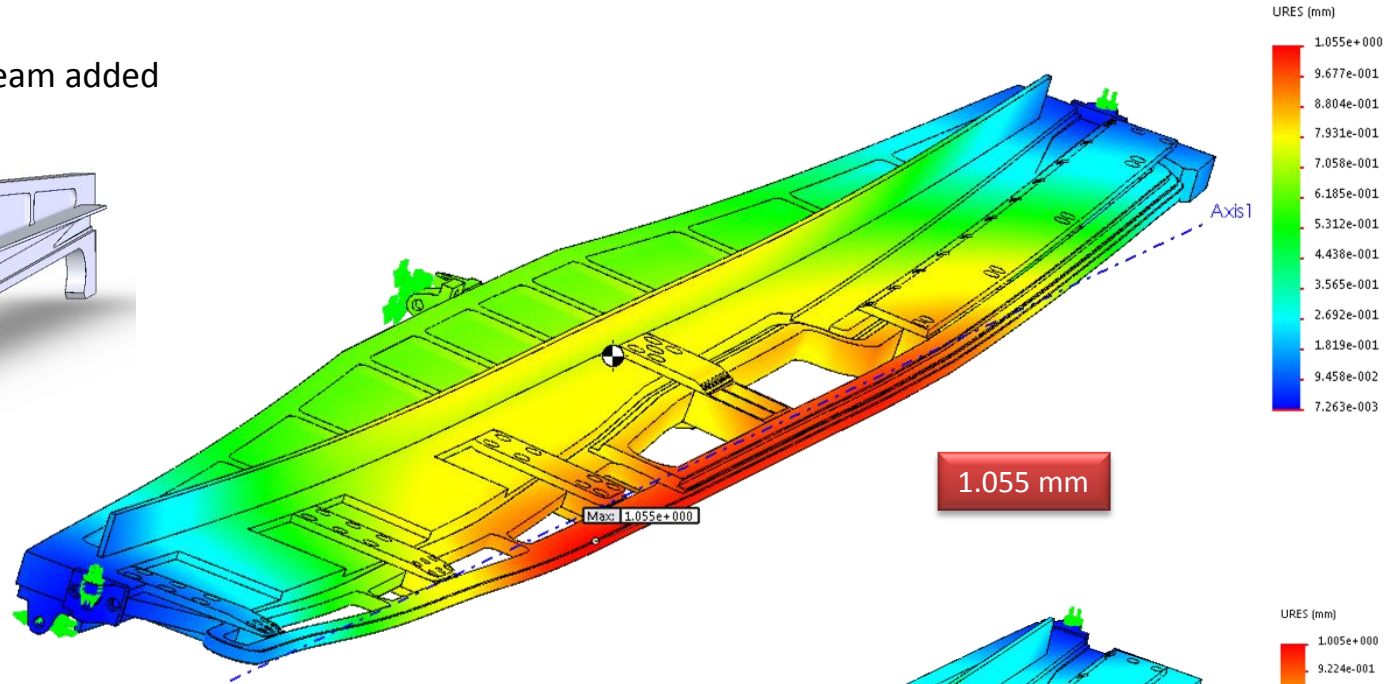
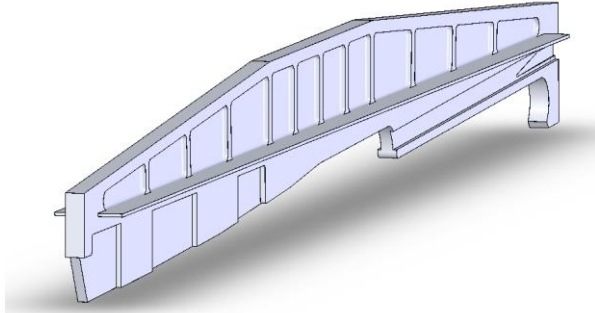


**Nov 7 (R8)** added more ribbing on spine

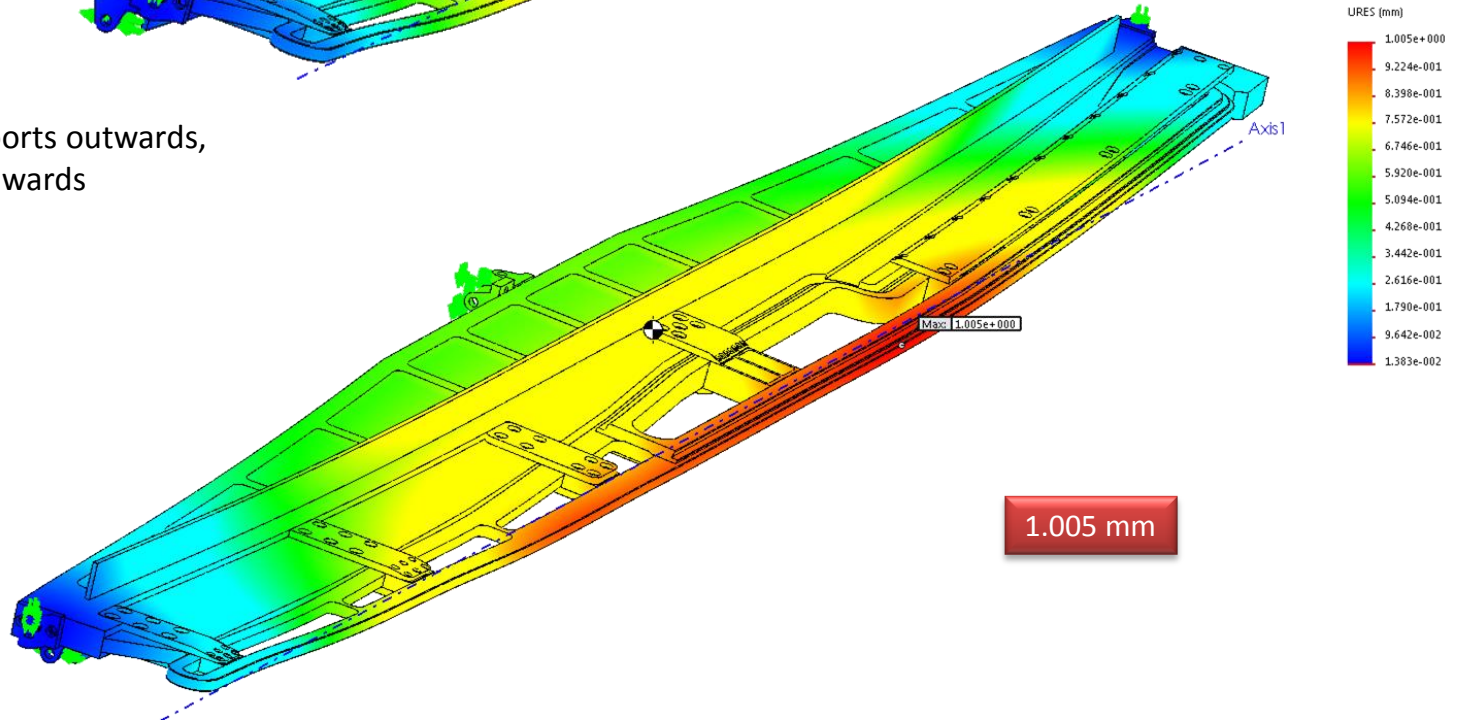


# Further changes to carrier, analyzed as an assembly

**Nov 7 (R9)** – includes upstream added material and side rib

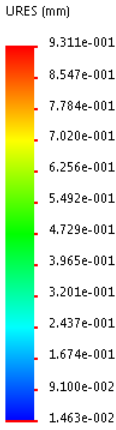
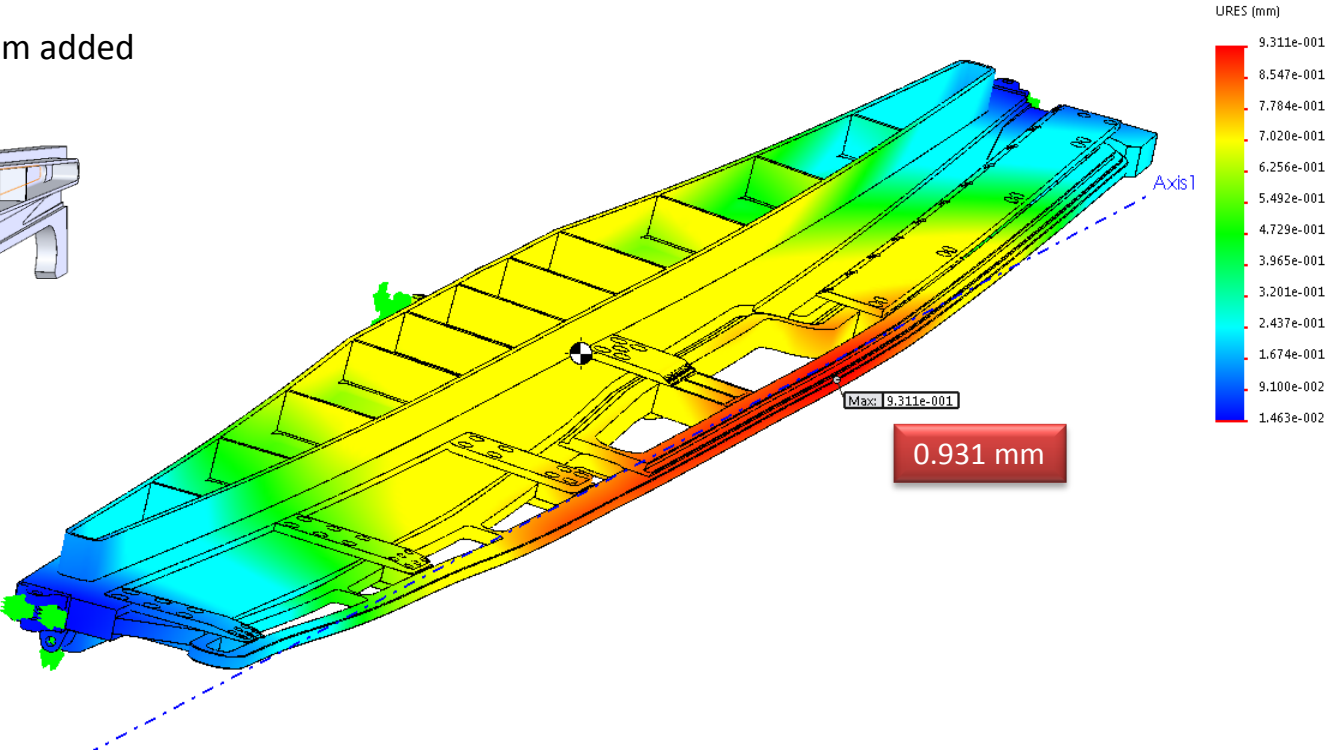
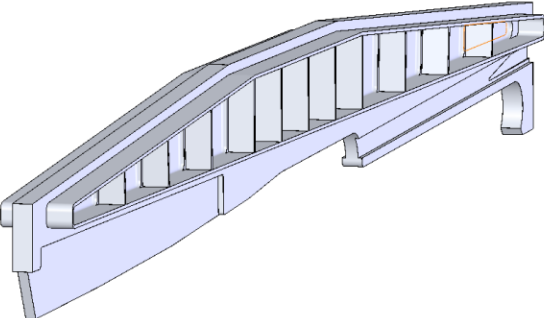


**Nov 7 (R10)** Moved R supports outwards, moved end phi supports inwards

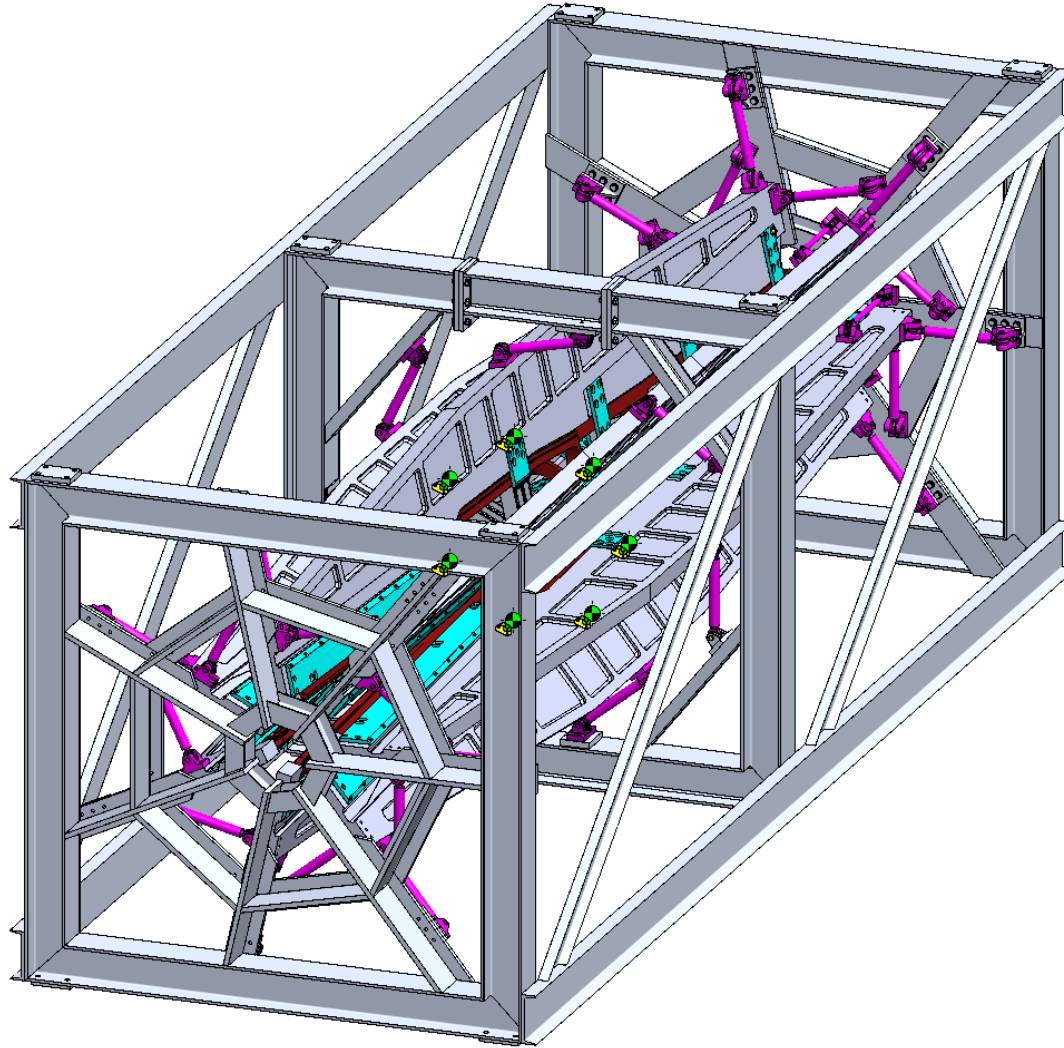


# Further changes to carrier, analyzed as an assembly

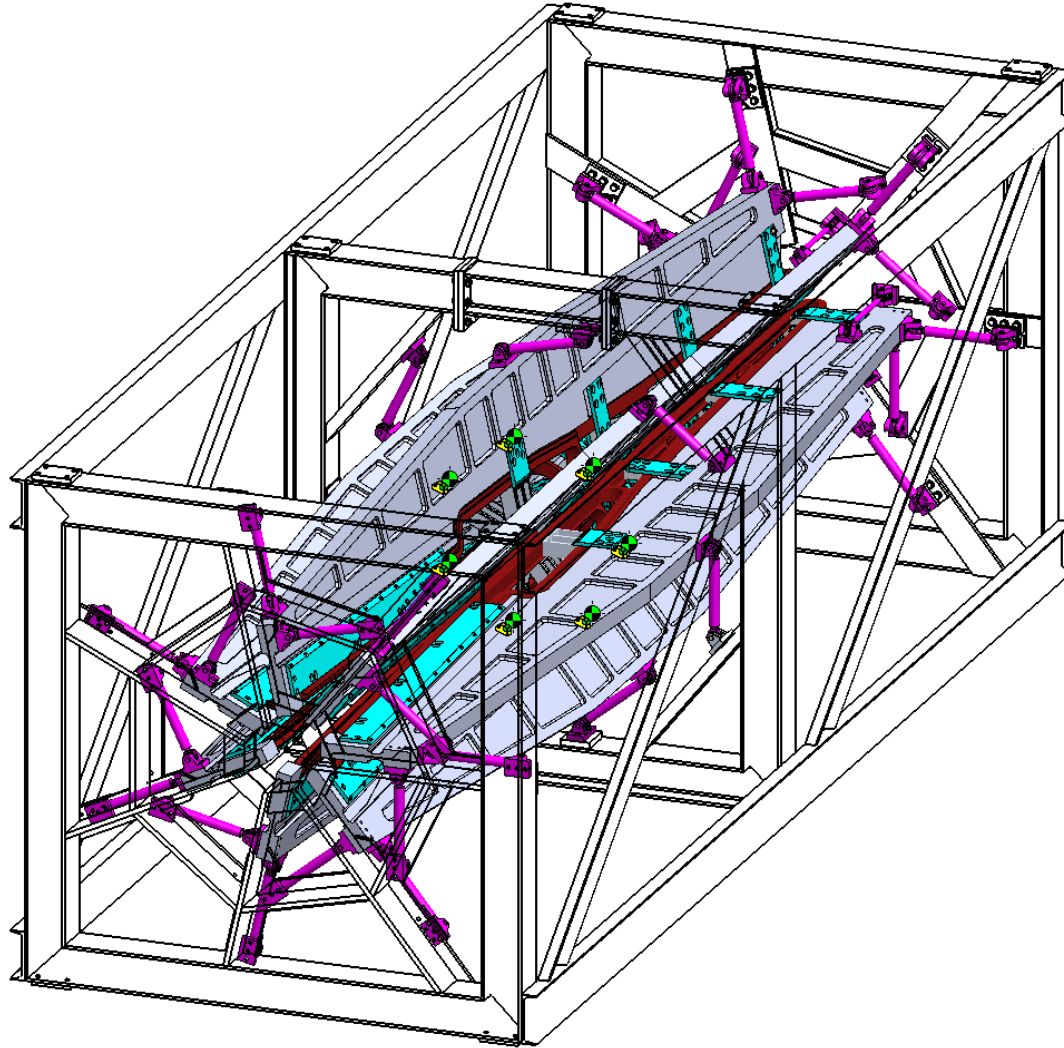
**Nov 7 (R11)** – includes upstream added material and side rib



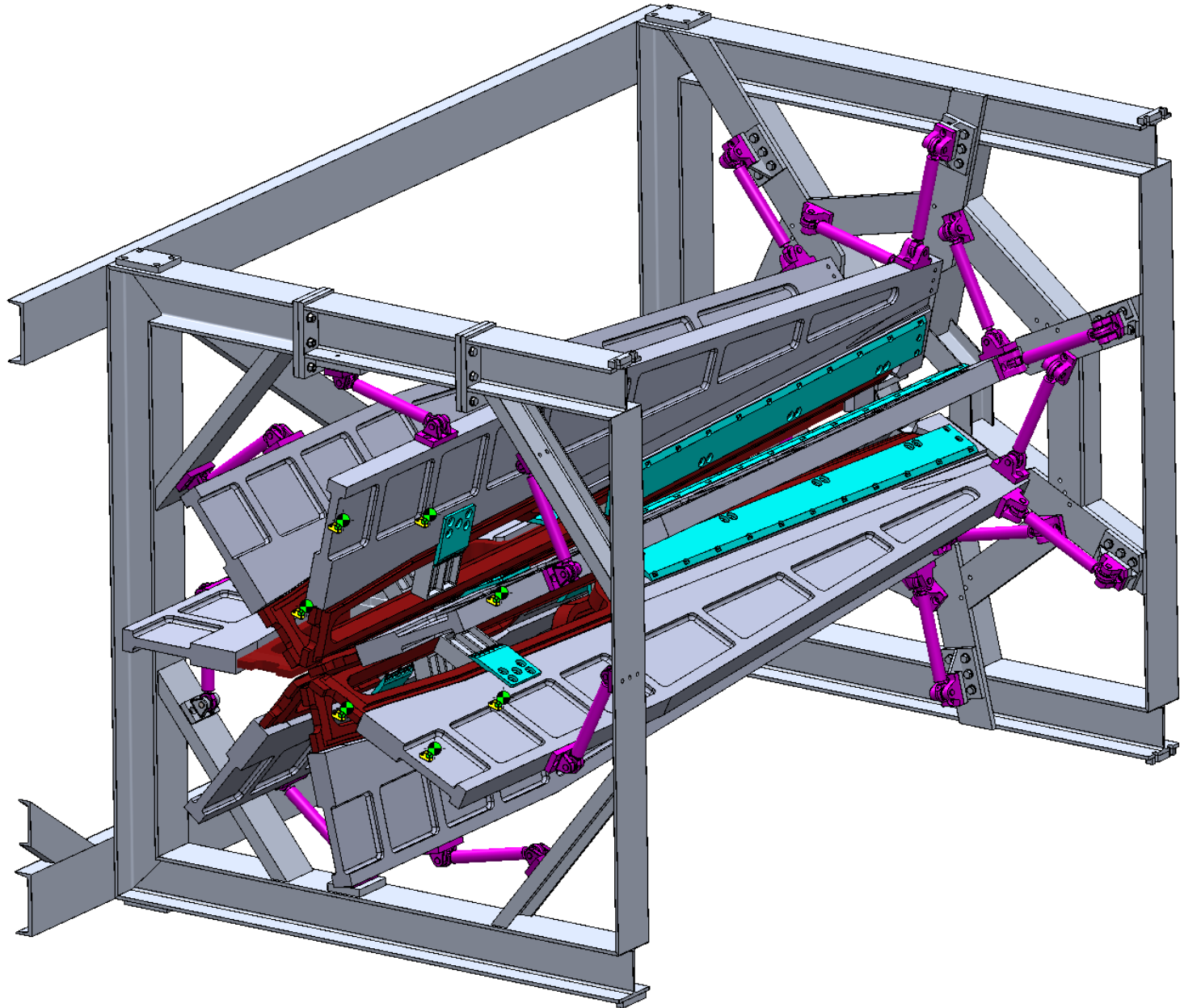
# Current Frame



# Current Frame



# Current Frame

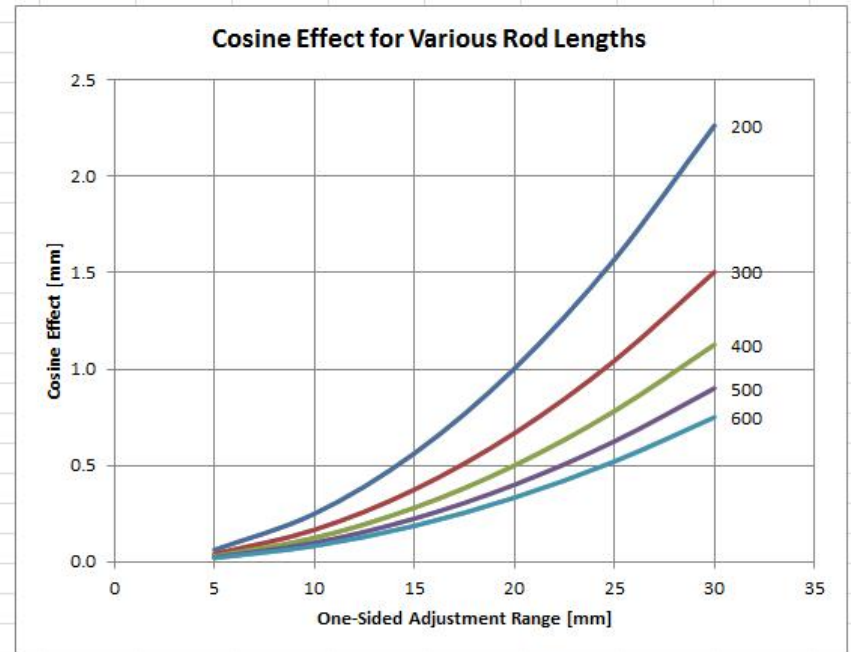
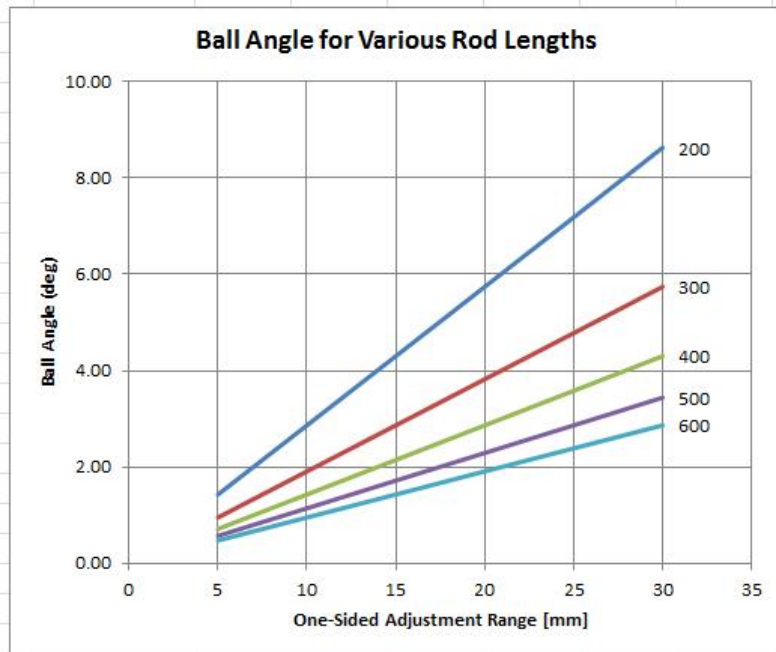
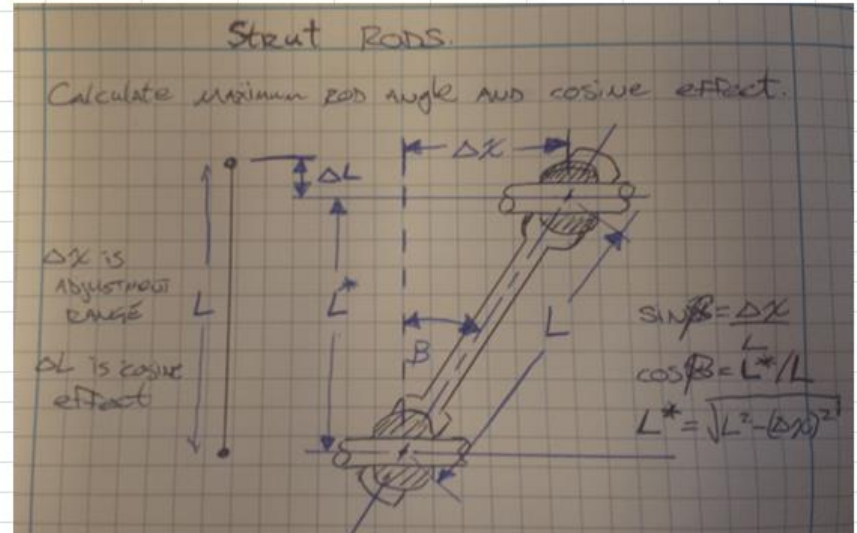




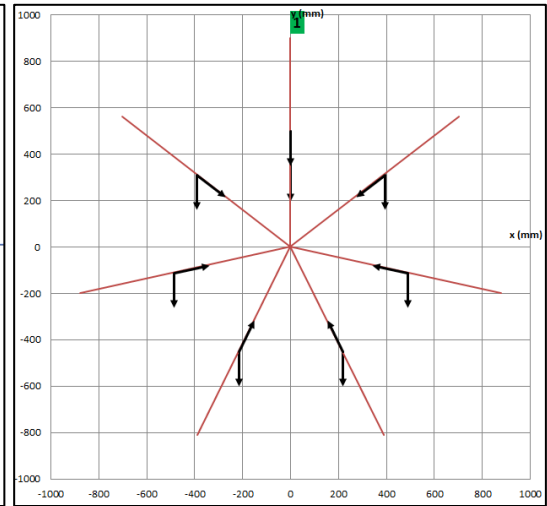
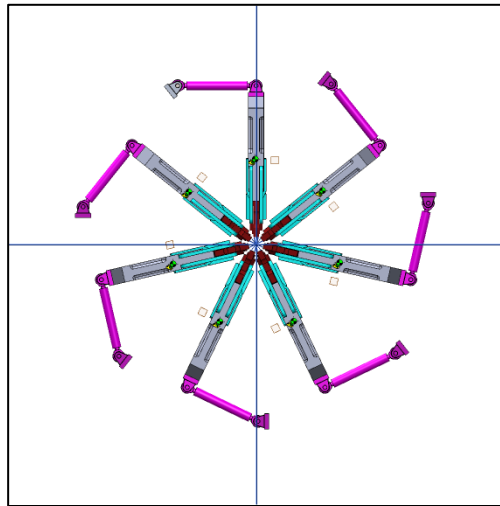
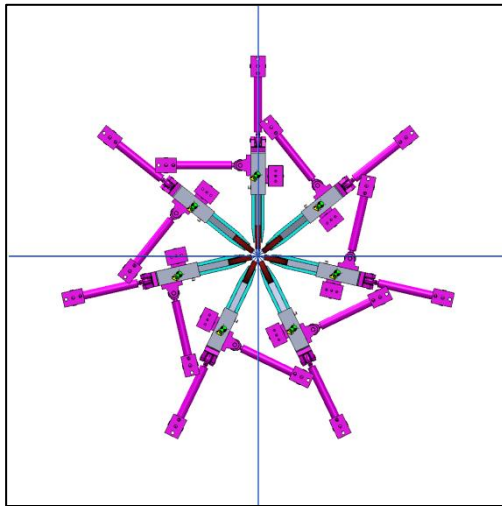
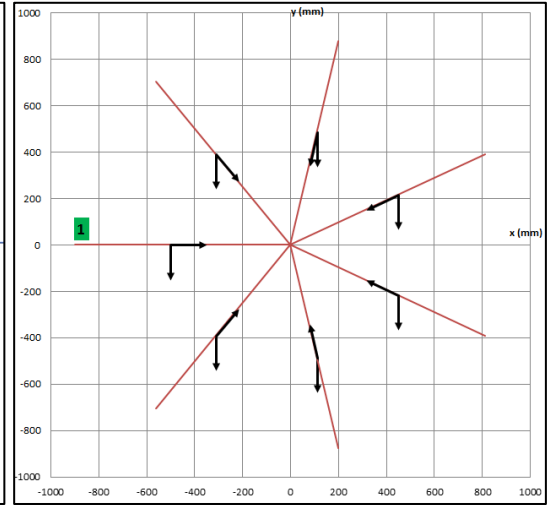
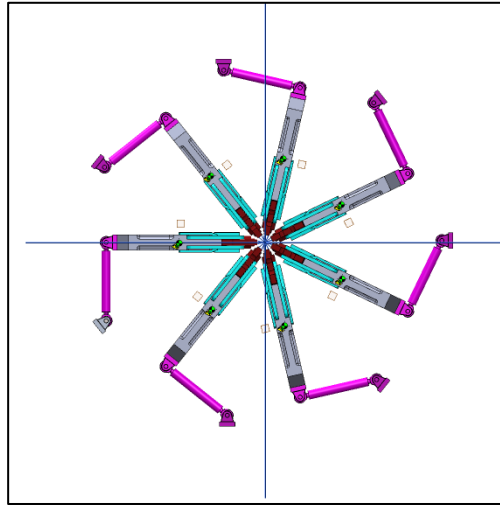
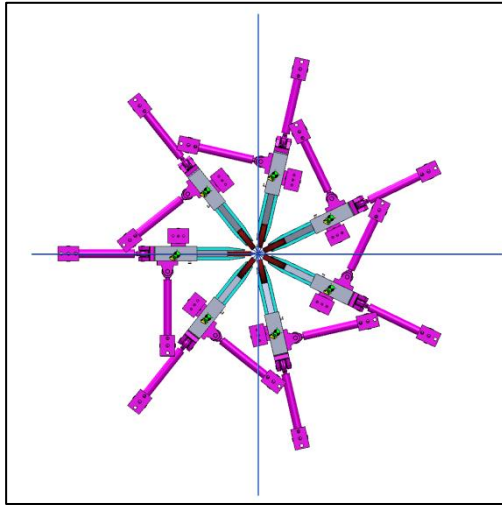
# Strut Links Current Length: 450 mm

Adjustment Range (mm) -->	Cosine Effect (mm)					
	5	10	15	20	25	30
200	0.06	0.25	0.56	1.00	1.57	2.26
300	0.04	0.17	0.38	0.67	1.04	1.50
400	0.03	0.13	0.28	0.50	0.78	1.13
500	0.03	0.10	0.23	0.40	0.63	0.90
600	0.02	0.08	0.19	0.33	0.52	0.75

Adjustment Range (mm) -->	Ball Angle (deg)					
	5	10	15	20	25	30
200	1.43	2.87	4.30	5.74	7.18	8.63
300	0.95	1.91	2.87	3.82	4.78	5.74
400	0.72	1.43	2.15	2.87	3.58	4.30
500	0.57	1.15	1.72	2.29	2.87	3.44
600	0.48	0.95	1.43	1.91	2.39	2.87



# Why not symmetry?



# Why not symmetry?

- Simplified nomenclature – “left high”, “right middle”, or something more clever.
  - Eliminate 3/7 of all relevant numbers (forces, positional tolerances... Anything in x-y is simpler. Less error prone.)
  - ease of assembly – alignment will be easier to undertake.
- Gravity sag cancels; effects due to gravity sag can be extracted
  - Improves systematics?
  - Additionally, placing one of the coils horizontal increases maximum gravity sag, since the thickness of the strongback in phi is limited and this orientation is hurt the most from this (due to  $h^3$  nature of second area moment)