RPW Consortium Meeting #21
Update on Science Performances

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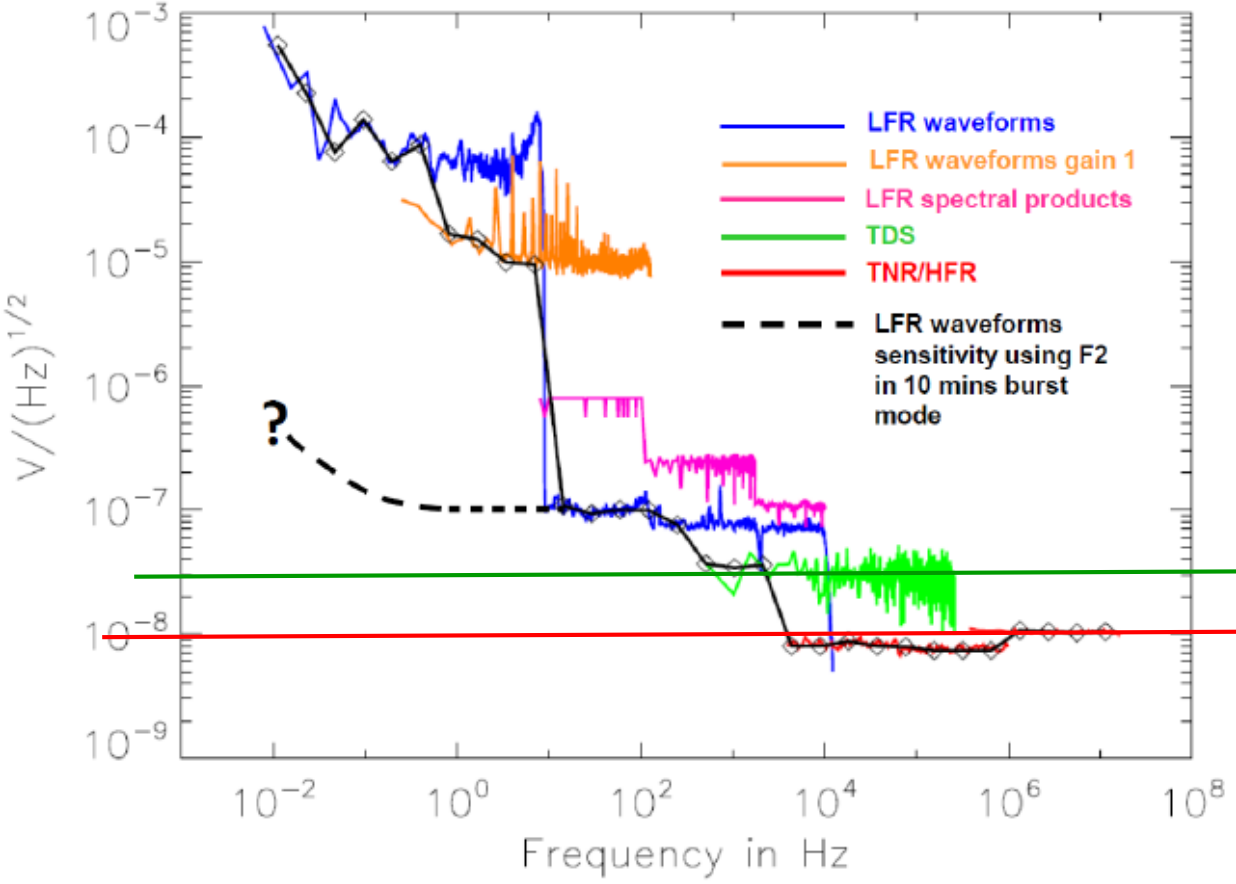
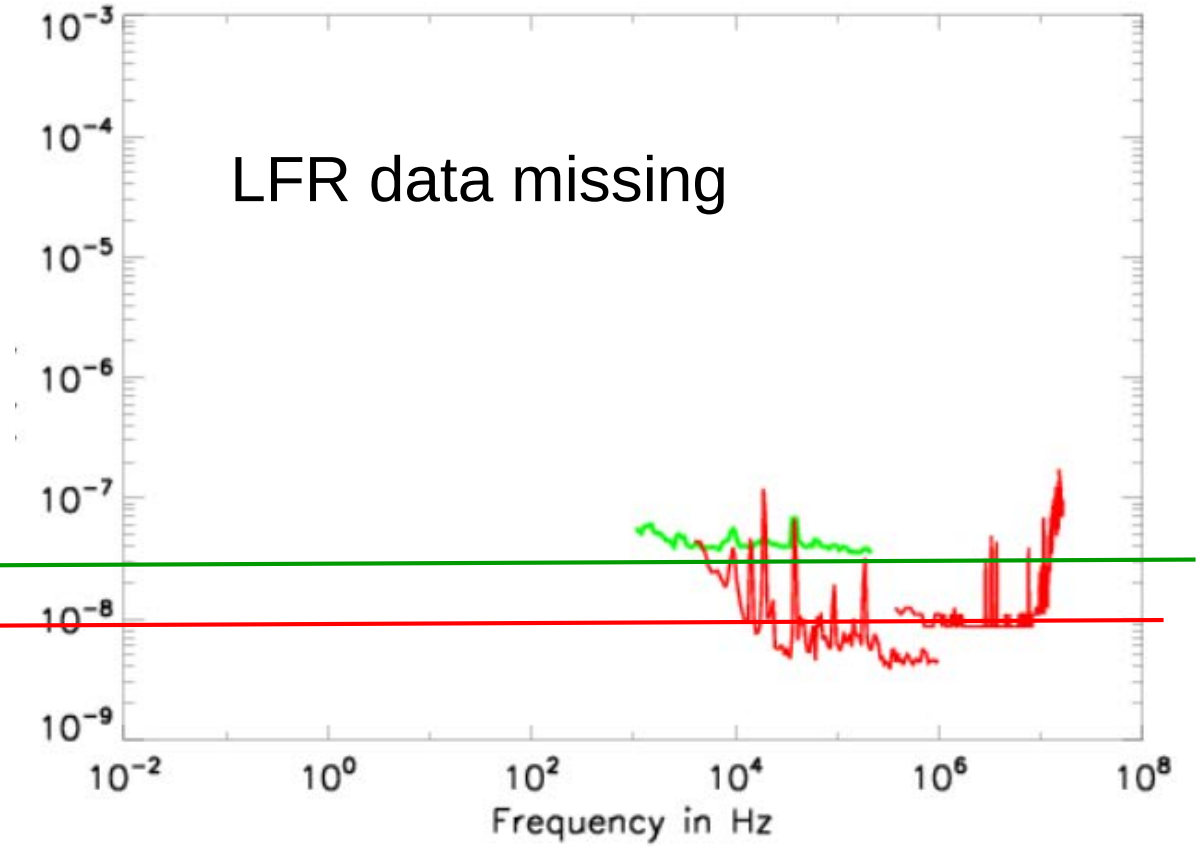
04-05 June 2018,
Dresden

- Update the Science Performances document using the PFM data
- Sensitivity levels provided by Team using their own calibration tools
- Use the MEB calibration campain or FFT data

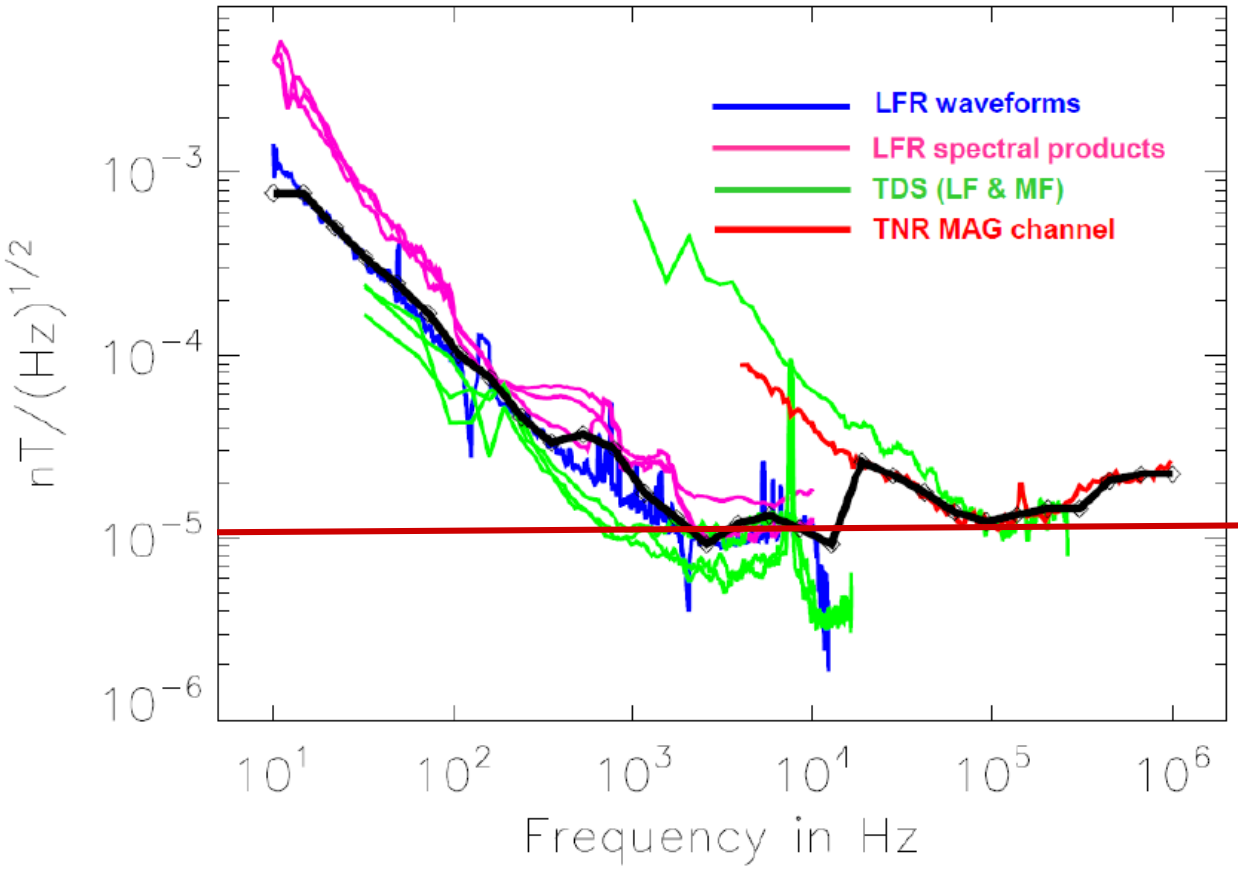
Electric

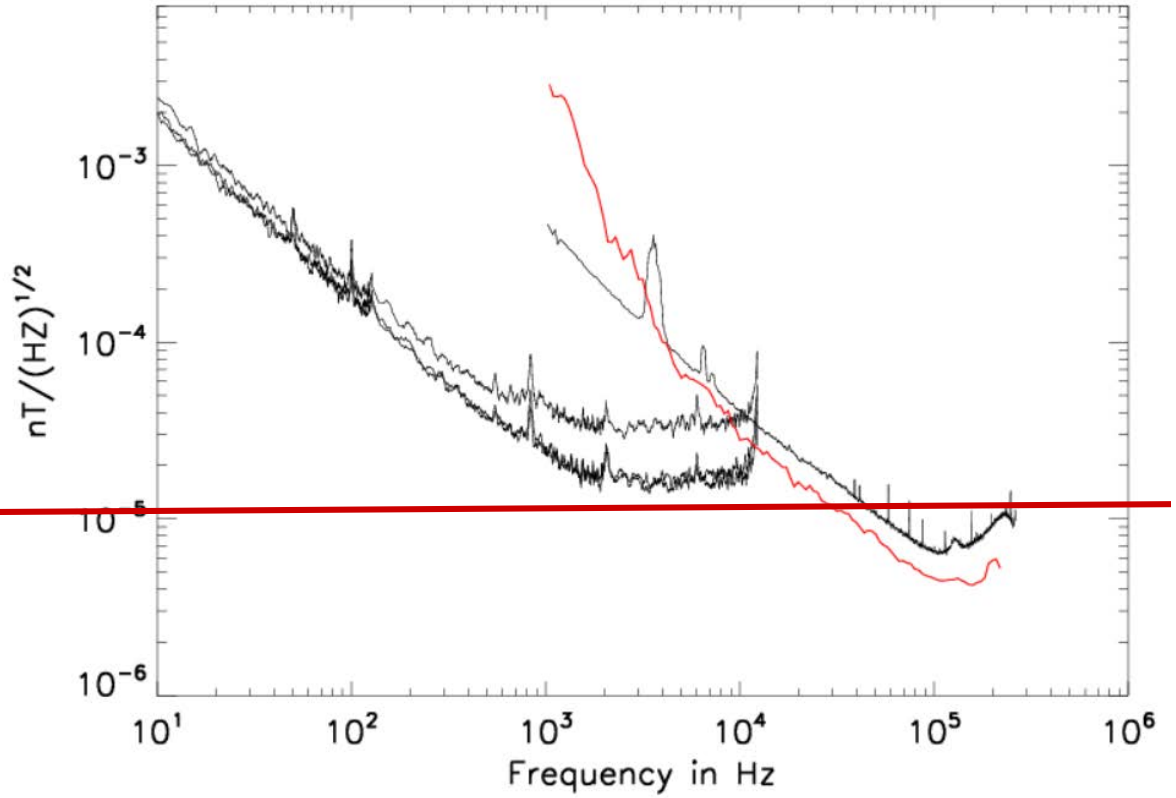




Magnetic

Need to look in latest data sent by Matthieu





Antenna simulations

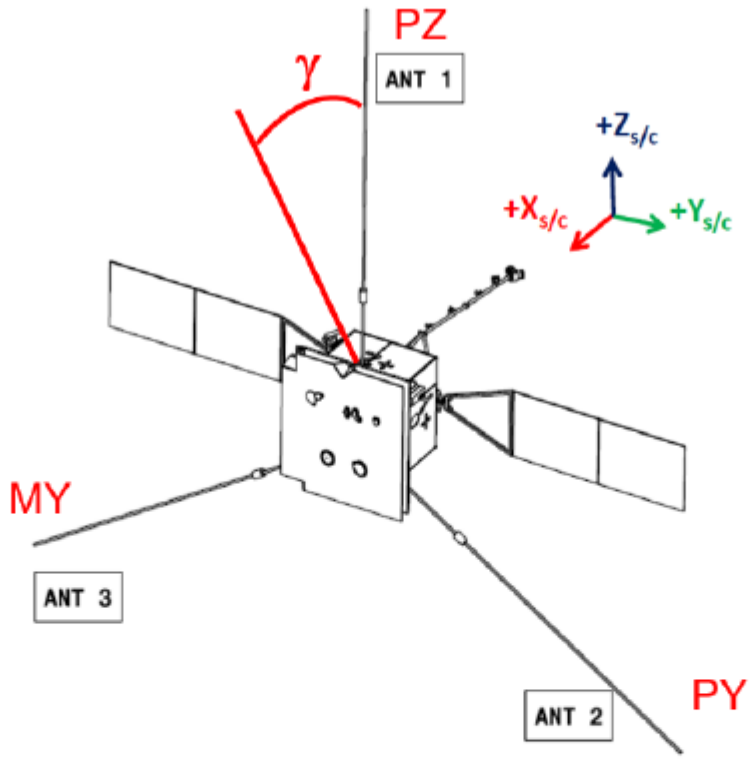


Figure 7

ANT	Mechanical antennas			Effective antenna vectors			
	h, m	θ, deg	φ, deg	h_e, m	θ, deg	φ, deg	γ, deg
PZ	6.5	0.0	0.0	4.41	9.1	-0.4	9.1
PY	6.5	125	90	3.91	132.2	75.2	13.6
MY	6.5	125	-90	3.91	132.3	-75.2	13.6
	Pseudo-dipoles			Effective vectors of dipoles			
Dip. PZ-PY	11.53	152.5	90	7.53	158.1	-90.9	5.6
Dip. PY-MY	10.65	90.0	90	5.60	90.00	90.0	0.0
Dip. MY-PZ	11.53	152.5	-90	7.53	158.2	-89.1	5.6

		Monopole	Dipole
Antenna capacitance C_A	Physical length *L (m)*	6.5	7.804
	radius *a (m)*	0.015	0.015
	C_A (pF) for f << c/2πL	**71.30**	**41.31**
Cstray (pF)	antenna Cstray		
	FM01	76.3 ± 4.0	
	FM02	78.9 ± 3.0	
	FM03	76.2 ± 2.7	
	FS	74.5 ± 2.0	
	mean	**76.5 ± 2.9**	
	preamplifier Cstray	33.0	
	Stud Cstray	0.0	
	Cstray	**109.5**	**54.7**
$\Gamma = C_A/(C_A + C_S)$	**Γ for f << c/2πL**	**0.48**	**0.43**
Leff	min	3.83	5.48
	max	4.41	7.53
ΓLeff for f << c/2πL	min	**1.83**	**2.35**
	max	**2.12**	**3.24**

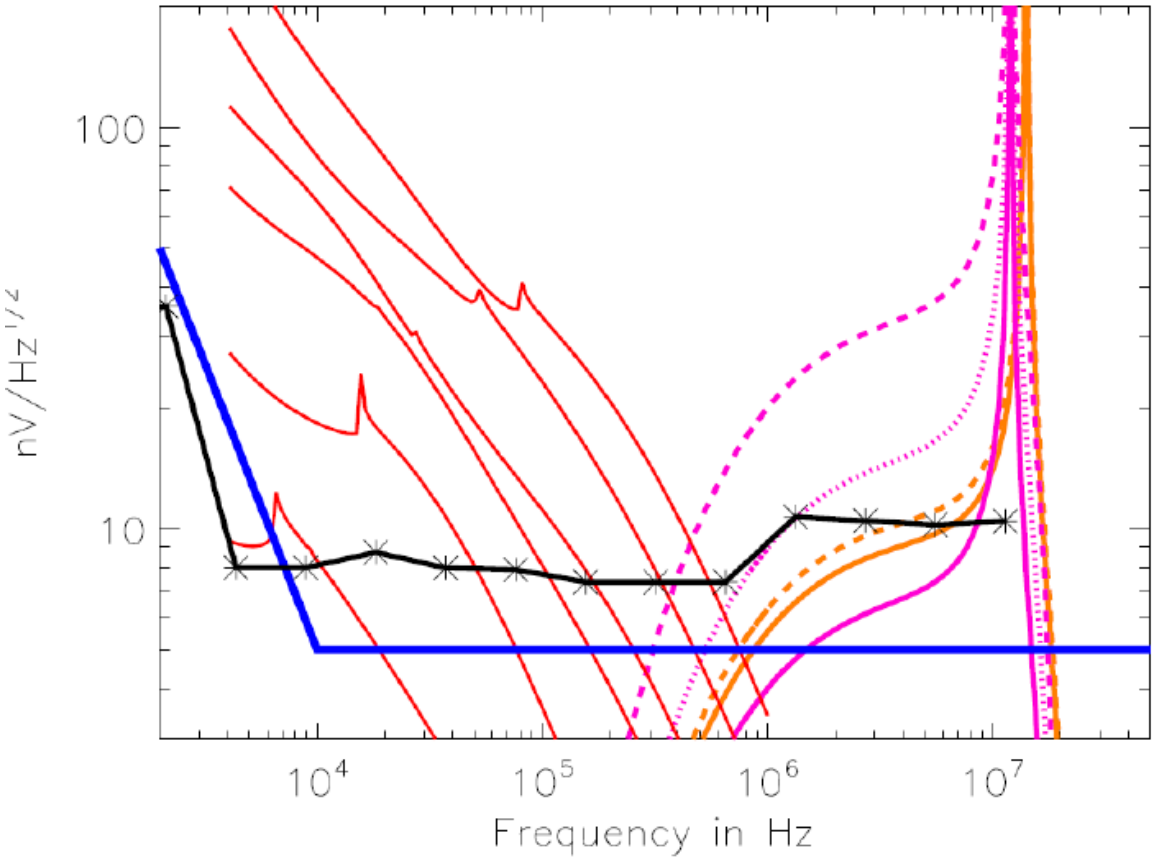
Table 6 : Antenna radio-electrical properties

	ANT1 Leff (m)	ANT1 γ (deg)	ANT2 Leff (m)	ANT2 γ (deg)	ANT3 Leff (m)	ANT3 γ (deg)
Plettemeier et al. [RD12]	3.797	8.66	3.385	10.19	3.277	10.13
Panchenko et al. [RD11]	4.41	9.1	3.91	13.6	3.91	13.6

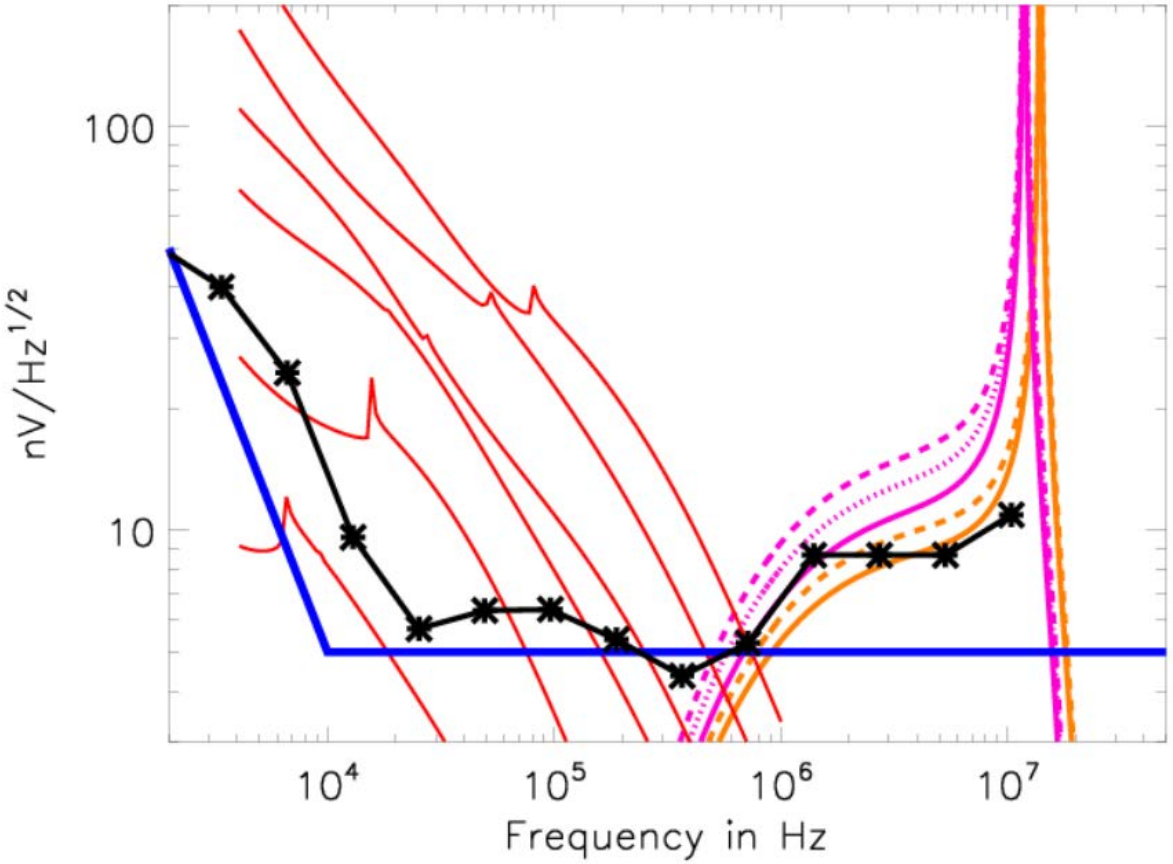
Table 6

Galaxy mode

EM



PFM



Antenna Bending

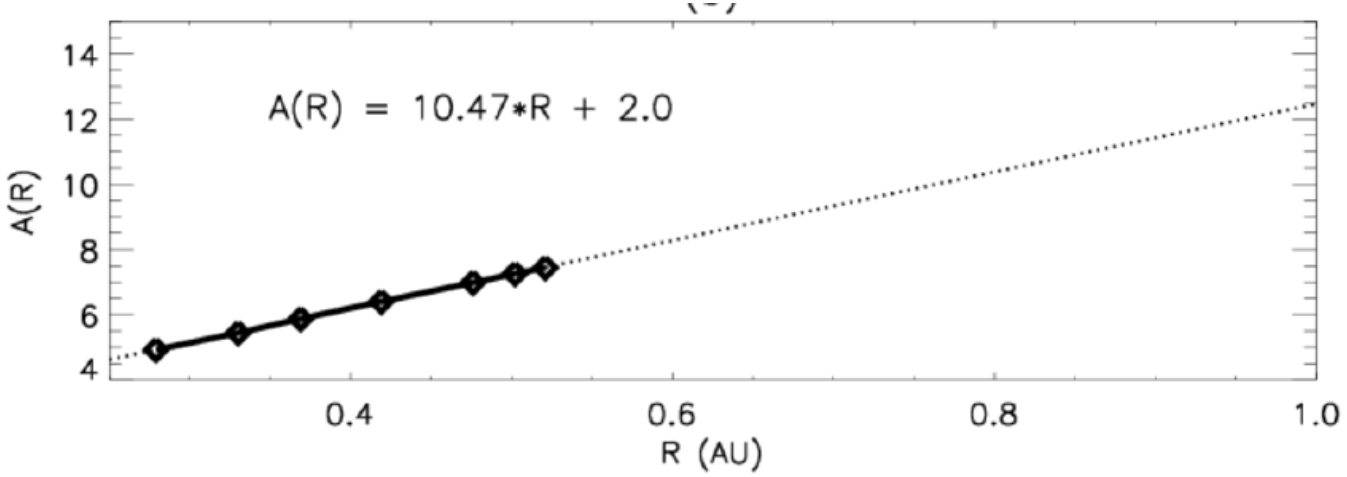
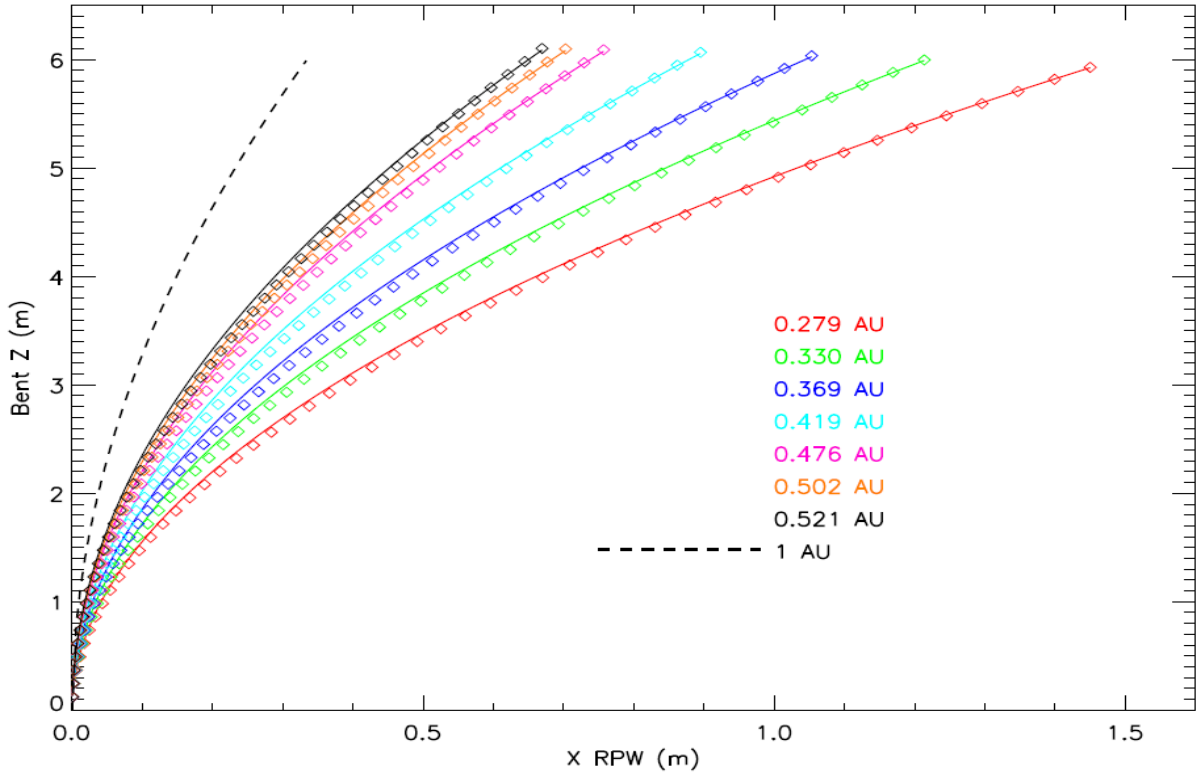
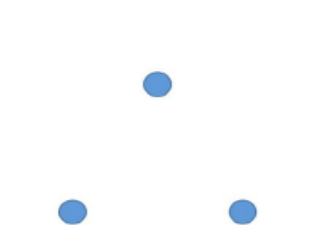


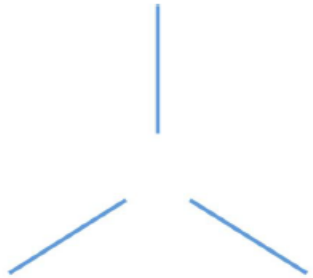
Figure 5: Antenna thermomechanical bending parameter A



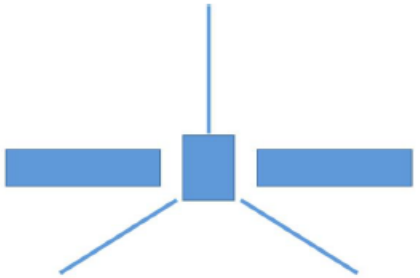
SPIS Simulations



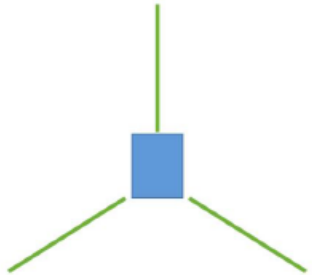
1) 3 conducting spheres alone



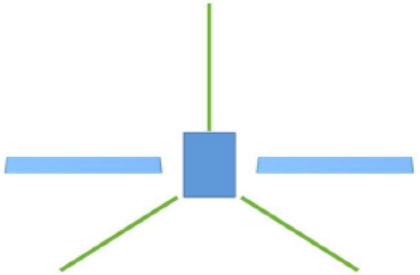
2) 3 RPW stacers alone (old materials)



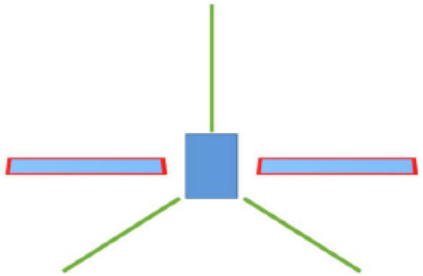
3) 3 RPW + SC body + full facing SA (old materials)



4) 3 RPW + SC body + no SA (new materials)



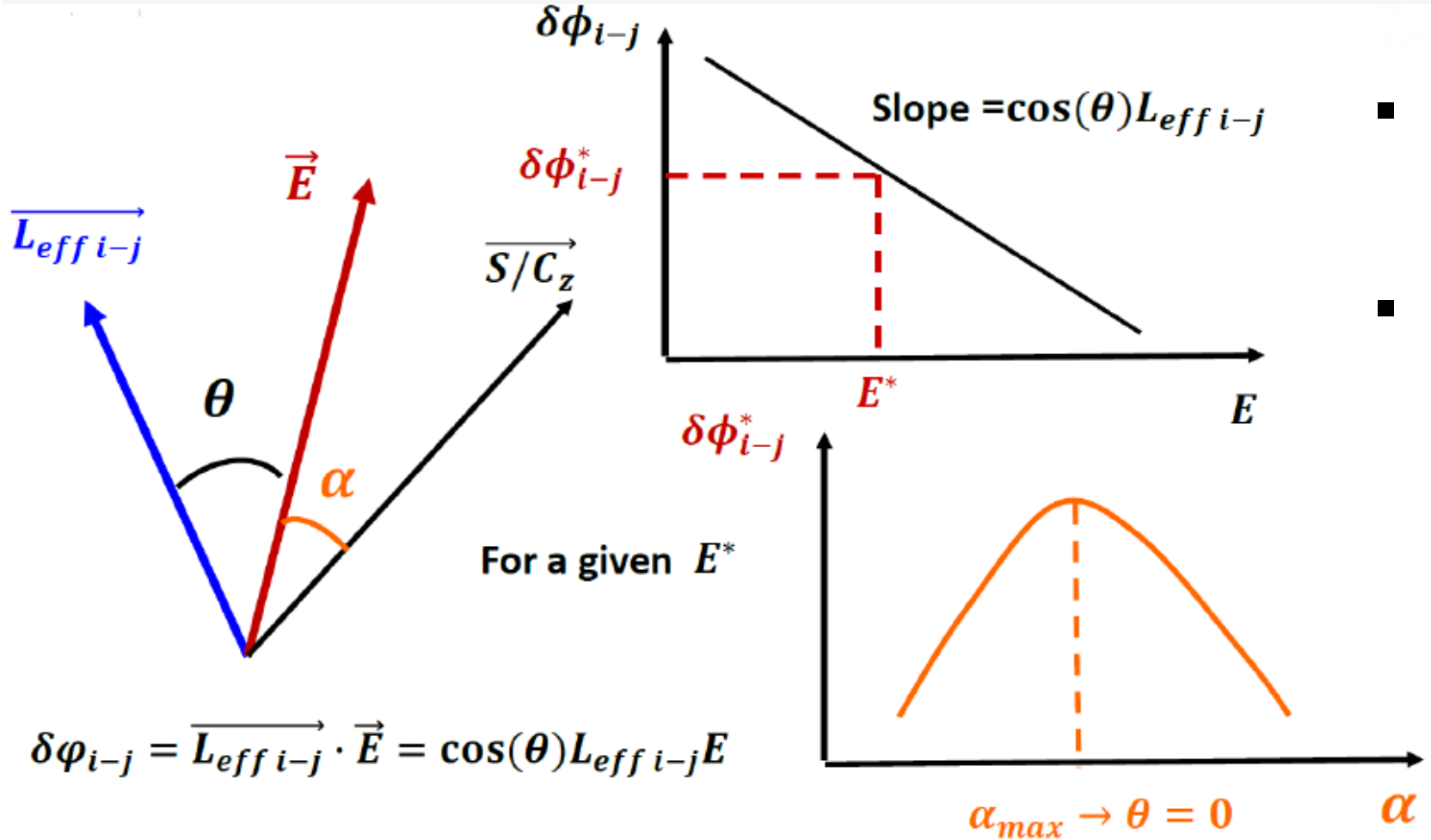
5) 3 RPW + SC body + rotated SA (new materials)



6) 3 RPW + SC body (new materials) + rotated SA with diel rear faces

Configuration	1	2	3	4	5	6
ΦRPW1 (V)	13.15	Range	Range	5.04	3.58	1.69
ΦRPW2 (V)	15.93	Range	Range	7.53	6.37	1.82
ΦRPW3 (V)	22.35	Range	Range	8.81	6.69	4.01
Leff 1-2 (m)	**6.80**	**5.83**	**4.83**	**6.28**	**7.05**	**0.33**
Leff 1-3 (m)	**6.80**	**5.83**	**4.83**	**9.51**	**7.86**	**5.88**
Leff 2-3 (m)	**6.40**	**0.00**	**0.00**	***3.23***	**0.82**	**5.55**
Lgeo_min 1-2 (m)	7.59	4.12	4.12	4.12	4.12	4.12
Lgeo_max 1-2 (m)	7.59	15.65	15.65	15.65	15.65	15.65
Lgeo_min 2-3 (m)	7.01	3.50	3.50	3.50	3.50	3.50
Lgeo_max 2-3 (m)	7.01	14.15	14.15	14.15	14.15	14.15

Further RPW/SPIS simulations



- Simulations were not successful @ LESIA
- Simulations stuck at some point and not progressing
- Ask help to ONERA?

Conclusions

Overal RPW PFM is compliant with respect to the Science Requirements

- **Need to include LFR data**
- **Need to look closer to the SCM data**
- **DF capabilities are OK**
- **Need help for the SPIS simulations**
- **Need to include EMC auto-compatibility results**
- **Still plan to do AKR rolls during cruise phase**
- **Still plan to measure SCM background in the lobes**