Attempts to implement the DORIS station antenna phase correction

Based on the document CO-SP-DO-OP-2460-CN, available on the IDS web site:

	Reference	: CO-SP-D0-OP-2460-CN
	Issue	: 16.2
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Title : Modelling of DORIS instruments

| X(θ)	Ground antennas			
θ (°)	Alcatel Type*		Starec Type*	
(°)	2 GHz	400 MHz	2 GHz	400 MHz
0	- 5	0	0	0
10	0	0	0	0
20	10	0	0	0
30	10	0	- 15	0
40	12	0	- 15	0
50	12	0	- 18	0
60	10	0	- 15	0
70	5	0	- 10	0
80	0	0	0	0
90	- 5	0	+ 3	0
ε (°)	2	4	2	4

- Modeling of the distance correction, according to the formula:

Δdist = c/f * phase-in-degree/360

Range correction as a function of elevation

for STAREC antennas

- Range-rate correction:

Range-Rate correction as a function of elevation
for STAREC antennas (rms = 2.e-5 m/s)
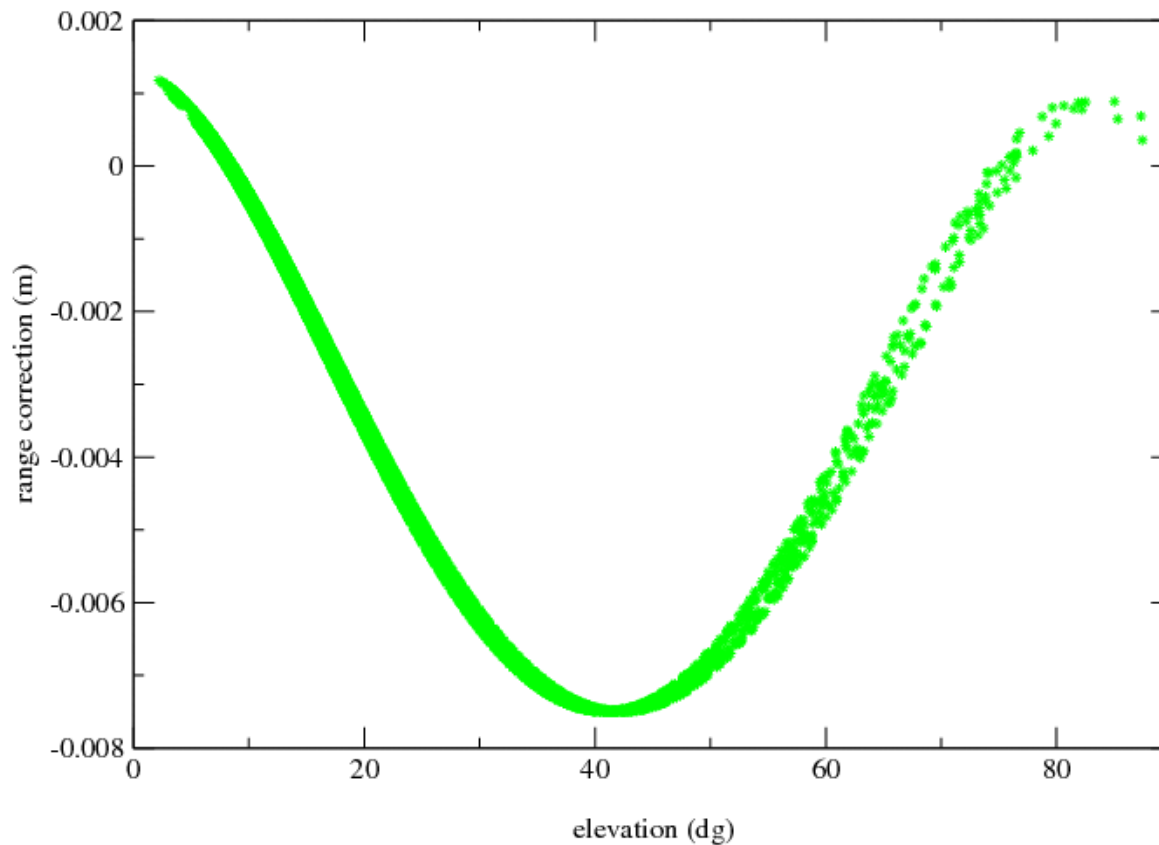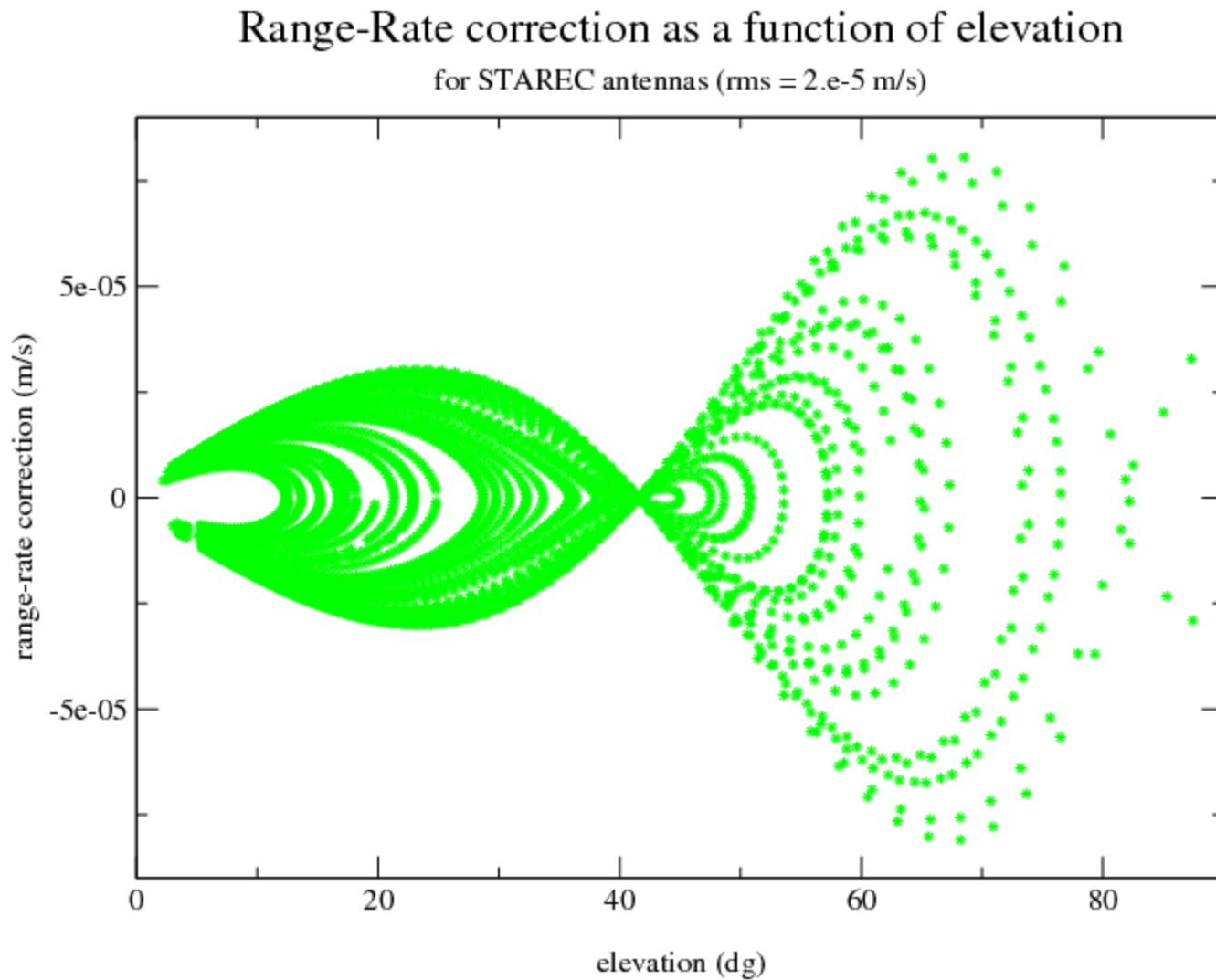
- Impact of the correction in terms of:
- Residuals
- Measurement zenithal tropospheric bias (MZB)
- Station heights

Remarks:
- mean residuals are 0.327 mm/s rms
- Correction rms is 0.02 mm/s

→ **In all cases, we observe an increase of the residuals !**

	Without solving for station heights			Solving for station heights		
	Additional noise (mm/s)	ΔMZB (mm)	ΔH station (mm)	Additional noise (mm/s)	ΔMZB (mm)	ΔH station (mm)
Negative correction	+0.015	+1.64	0	+0.019	+1.9	-2.35
Positive correction	+0.021	-1.61	0	+0.015	-1.9	+2.24

- When dividing by 5 the amplitude of the correction:

Remark:

- Correction rms is 0.004 mm/s

	Without solving for station heights			Solving for station heights		
	Additional noise (mm/s)	ΔMZB (mm)	ΔH station (mm)	Additional noise (mm/s)	ΔMZB (mm)	ΔH station (mm)
Negative correction	-0.0044	+0.33	0	+0.0040	+0.39	-0.476
Positive correction	+0.0069	-0.33	0	+0.0031	-0.39	+0.476

CONCLUSION:

- Correction (or implementation) is not convincing in its present state ;
- Implementation of full phase wind up (according to the azimuth) should be tested.