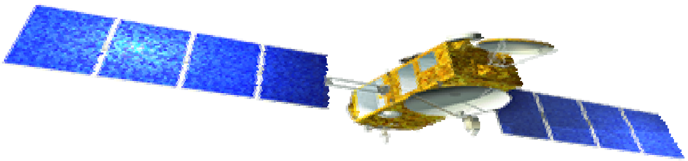
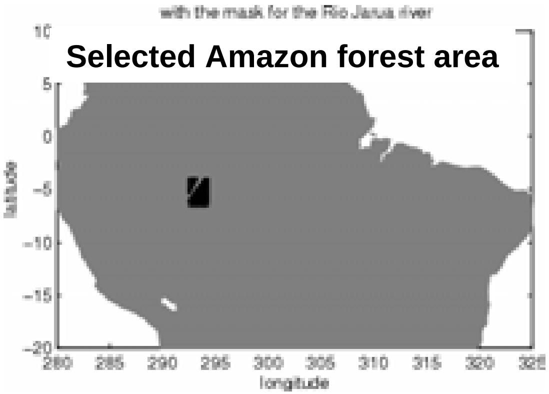


Assessment of the TMR/JMR brightness temperatures and products

E. Obligis, N. Tran and L. Eymard

Comparison with AMSU-A TBs over Amazonian Forest
Comparison with ECMWF simulations
Validation of the TMR/JMR products using radiosonding measurements
JMR jump/yaw impact
Conclusions



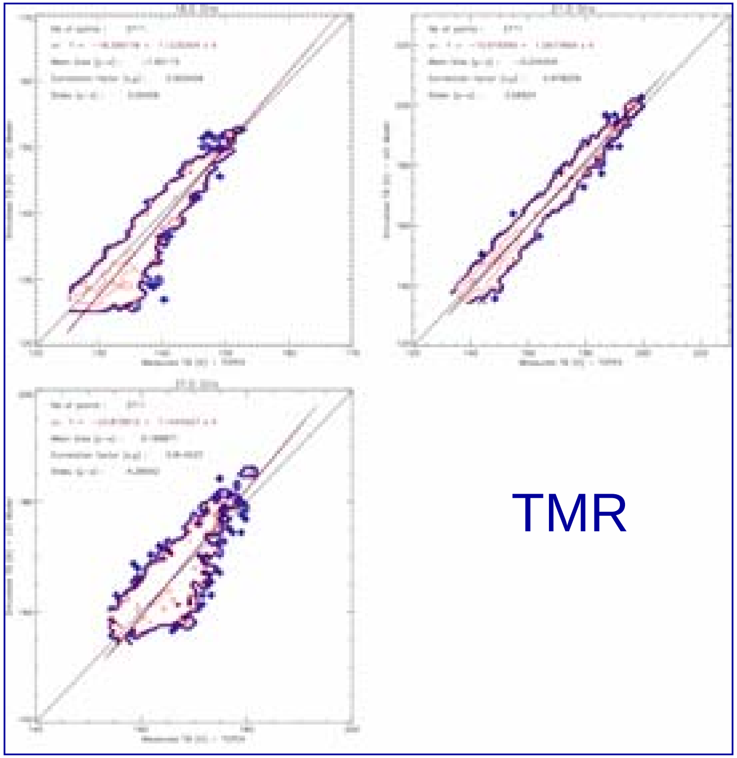
Mean TB over a stable reference target : the Amazonian forest

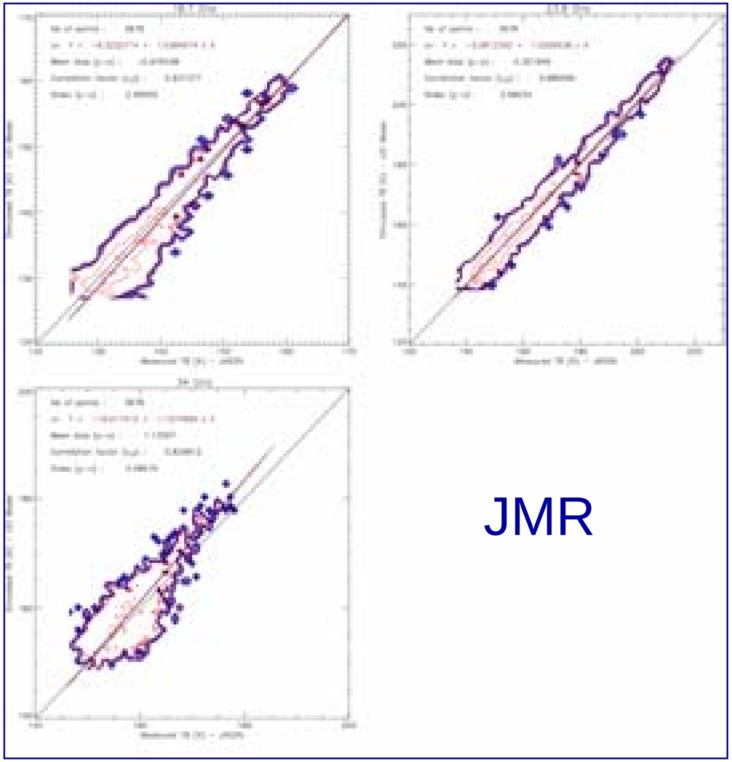
Mean TB (K)

Freq (GHz)	18.0*	18.7	21.0	23.8	31.4	34.0	36.5	37.0	#
Amsu-A at nadir	-	-	-	285.8	282.7	-	-	-	641
TMR	278.6	-	278.1	-	-	-	-	277.6	2160
JMR	-	283.5	-	283.4	-	280.2	-	-	227
SSM/I	-	284.2	-	283.4	-	280.5	-	-	14564
ERS-2	-	-	-	285.7	-	-	291.9	-	3937

- TMR brightness temperatures too low regarding AMSU
- JMR/SSMI in perfect agreement

Comparison between measurements and simulations on ECMWF analyses with the UCL model

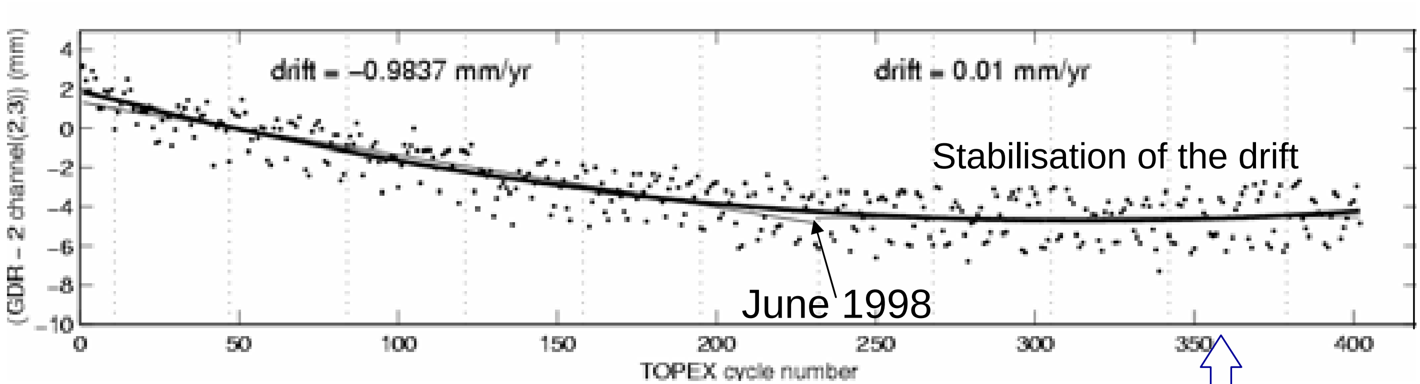


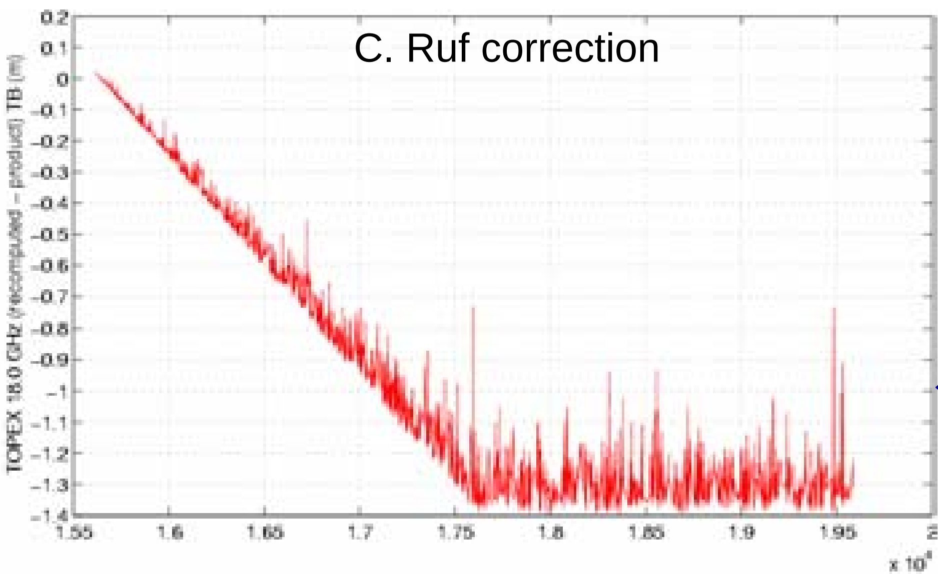


- Biases around 2K
- Standard deviation around 3K

⇒ No important problem of calibration

TMR 18 GHz drift correction

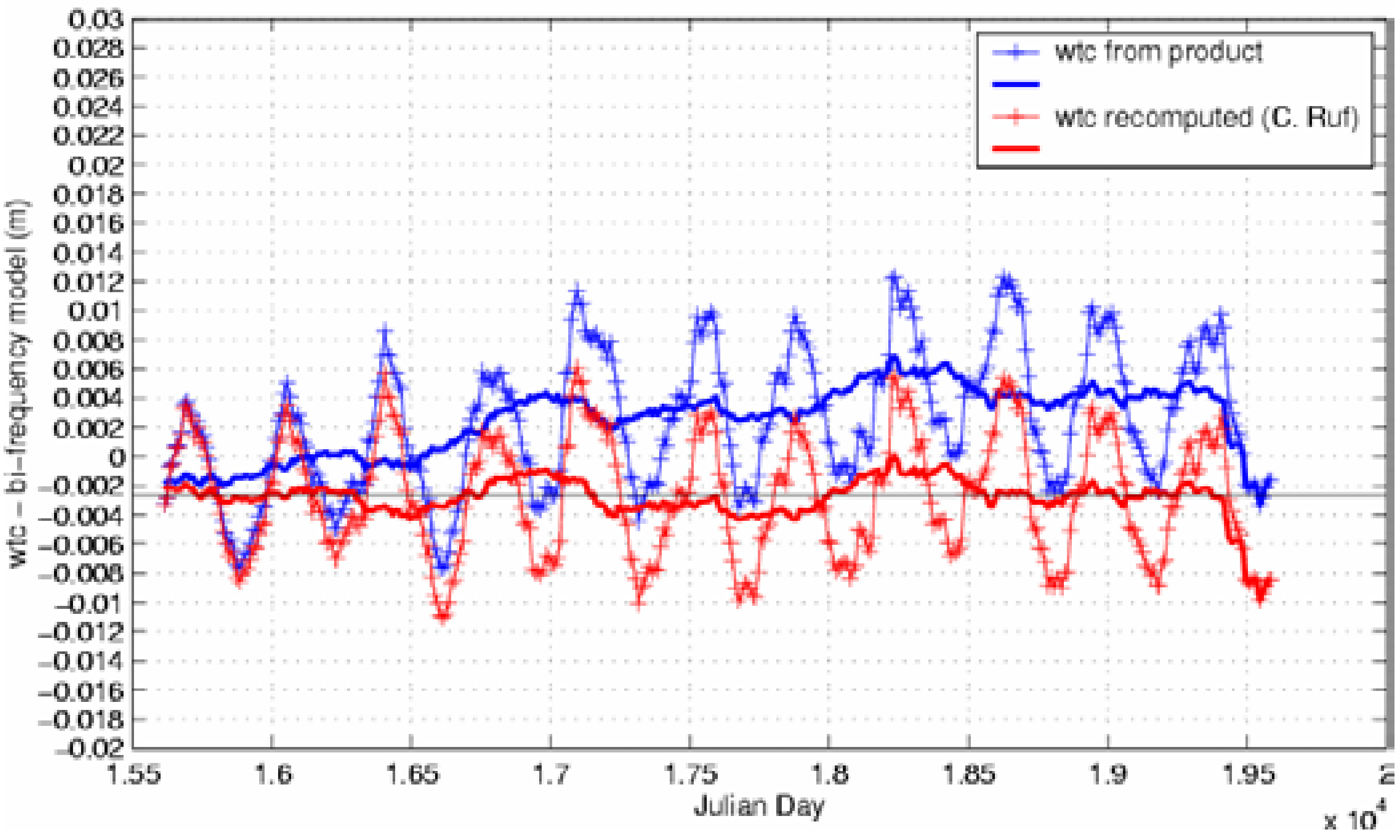




dh difference between GDR and bi-frequency (wo 18 GHz) products

TB18 difference between recomputed and product for radiosonding dataset

Difference between GDR and bi-frequency dh

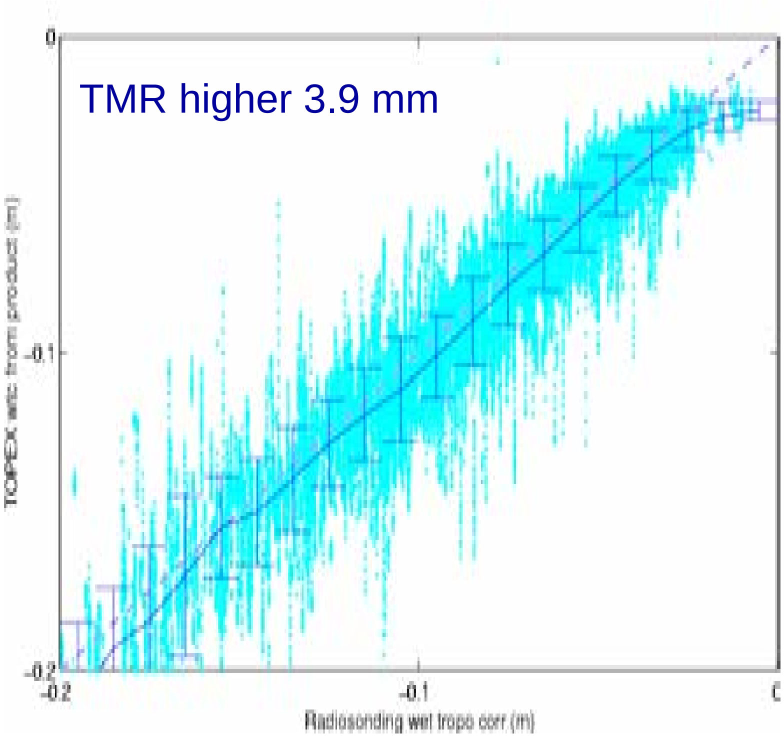


⇒ After correction of the 18 GHz drift, difference between bifrequency (21 and 37 GHz) products and standard products is constant.

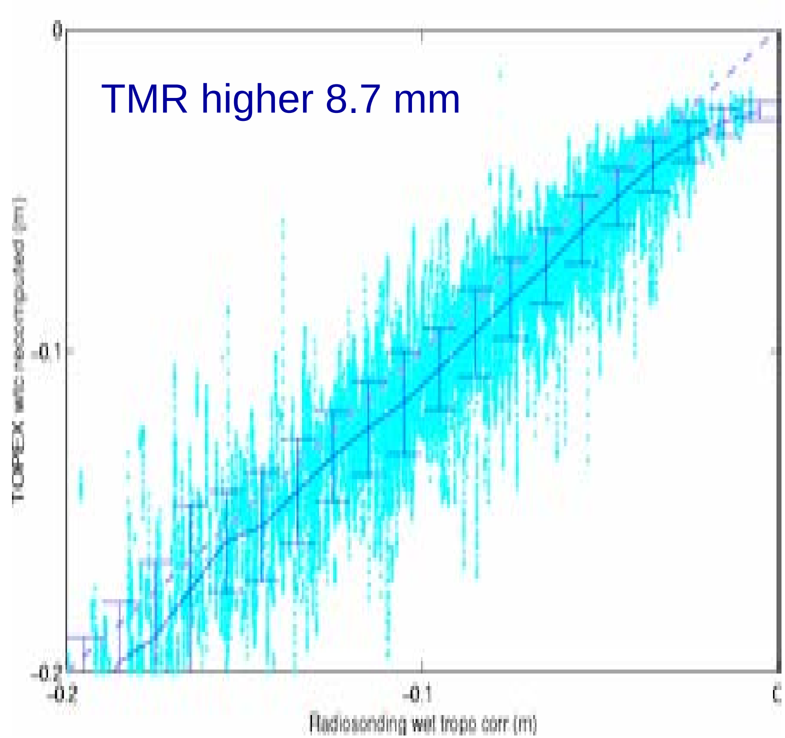
⇒ Efficient correction

TMR products validation using 11 years of ECMWF radiosonding measurements 48093 points

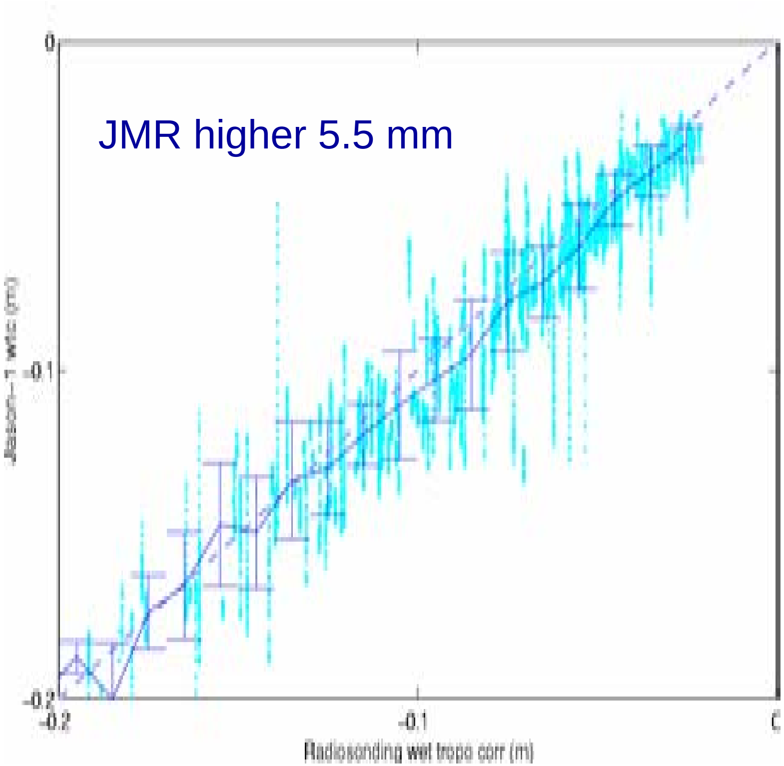
without TMR drift correction

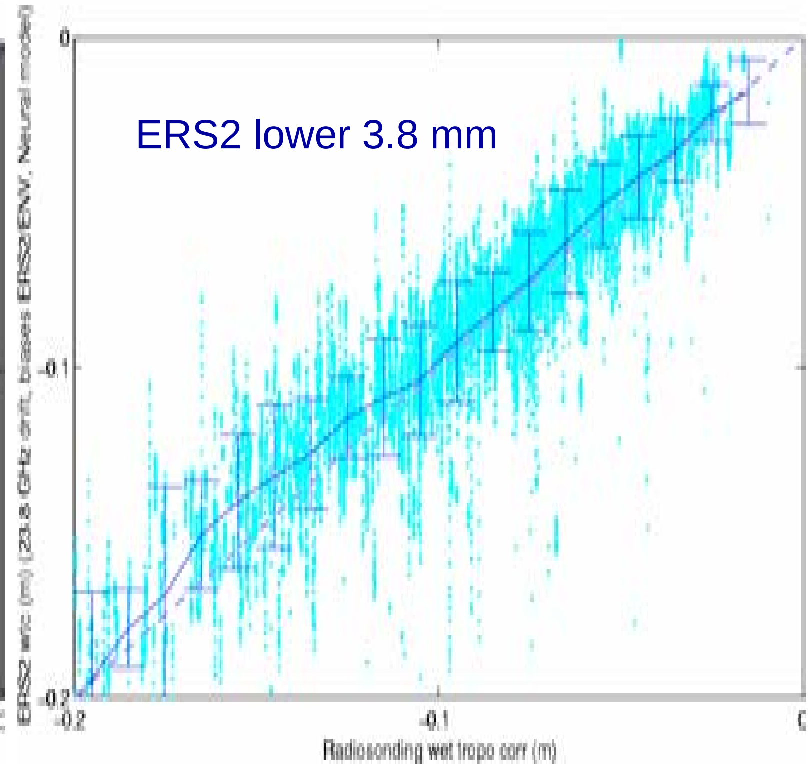


with TMR drift correction



JMR/ERS2 products validation using ECMWF radiosounding measurements





Comparison with radiosonde measurements

For radiosonde (X) in [-0.15; 0] m	**JMR**	**TMR**	**TMR*** (recomputed)	**ERS-2**** (recomputed)
Mean(Y-X) (mm)	5.5	3.9	8.7	-3.8
Std(Y-X) (mm)	12.3	11.9	11.8	14.9

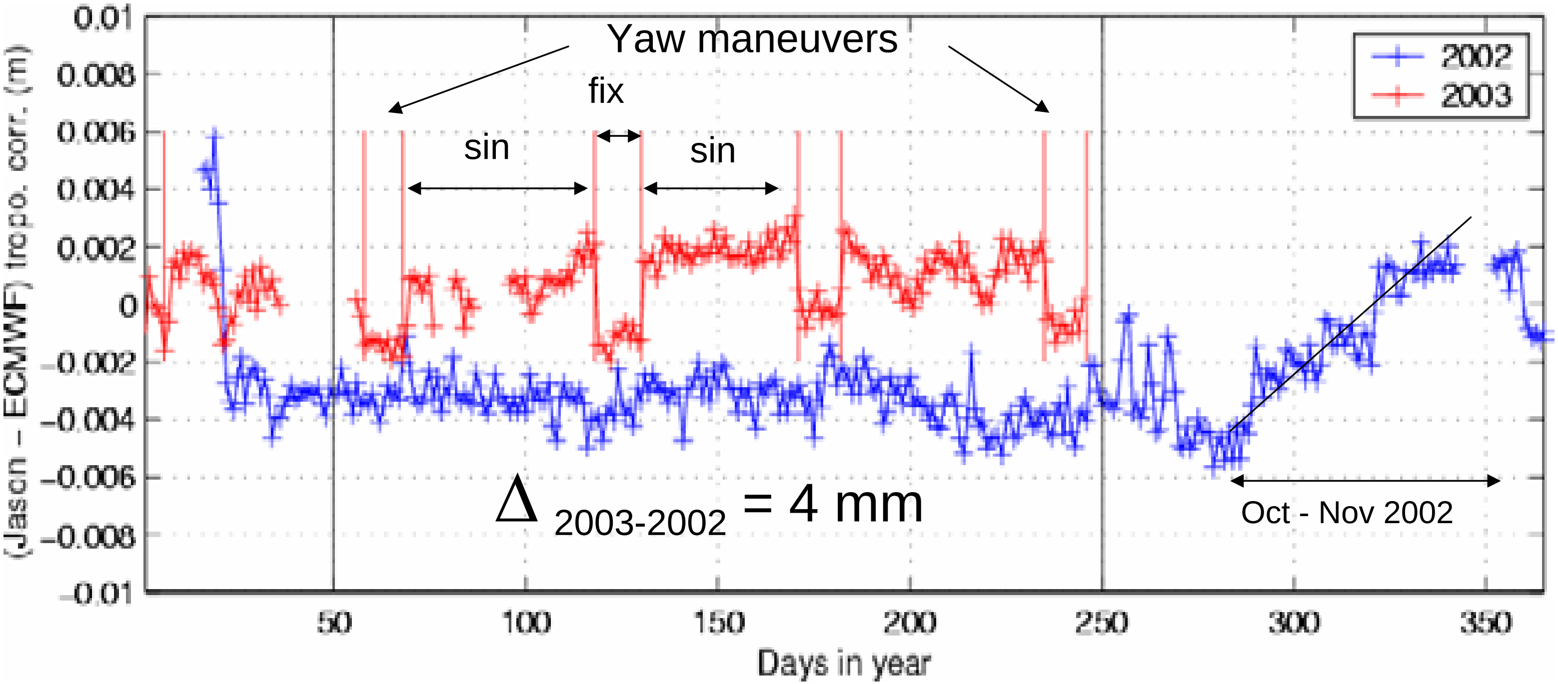
* 18.0 GHz Measurements corrected for the drift and then re-computation of the wet tropo. corr. (C. Ruf, June 2002)
**measurements ajusted and use of the Envisat NN algorithm (E. Obligis et al., 2003)

⇒TMR 18 GHz drift correction degrades the product

⇒JMR and TMR overestimate between 0 and 15 cm

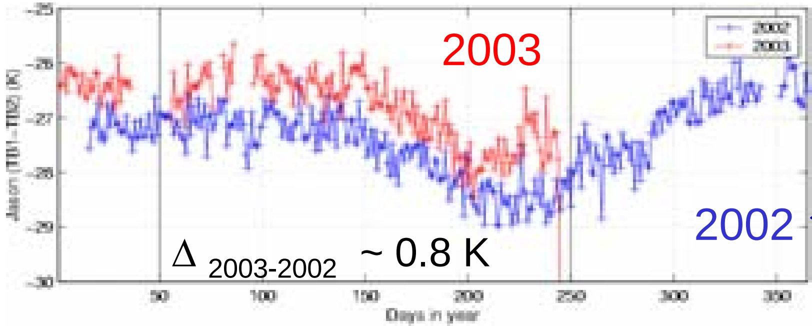
JMR ramp + yaw state dependence

Pointed out by J. Dorandeu and co.

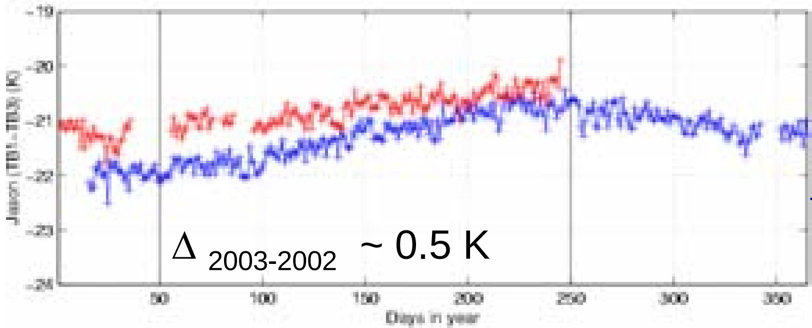


=> JMR dh lower by 4 mm in 2003

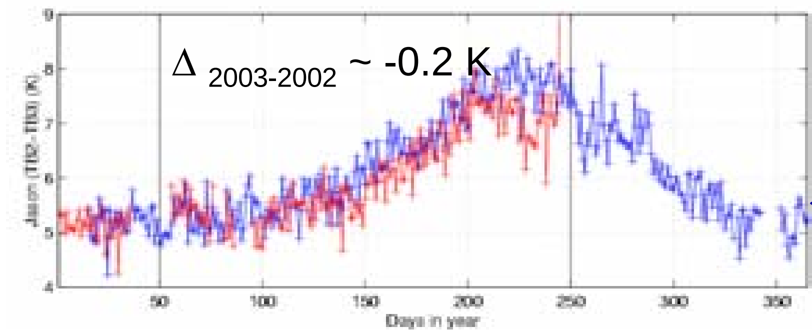
Comparison between 2002 and 2003 :
daily mean difference
between 2 TBs



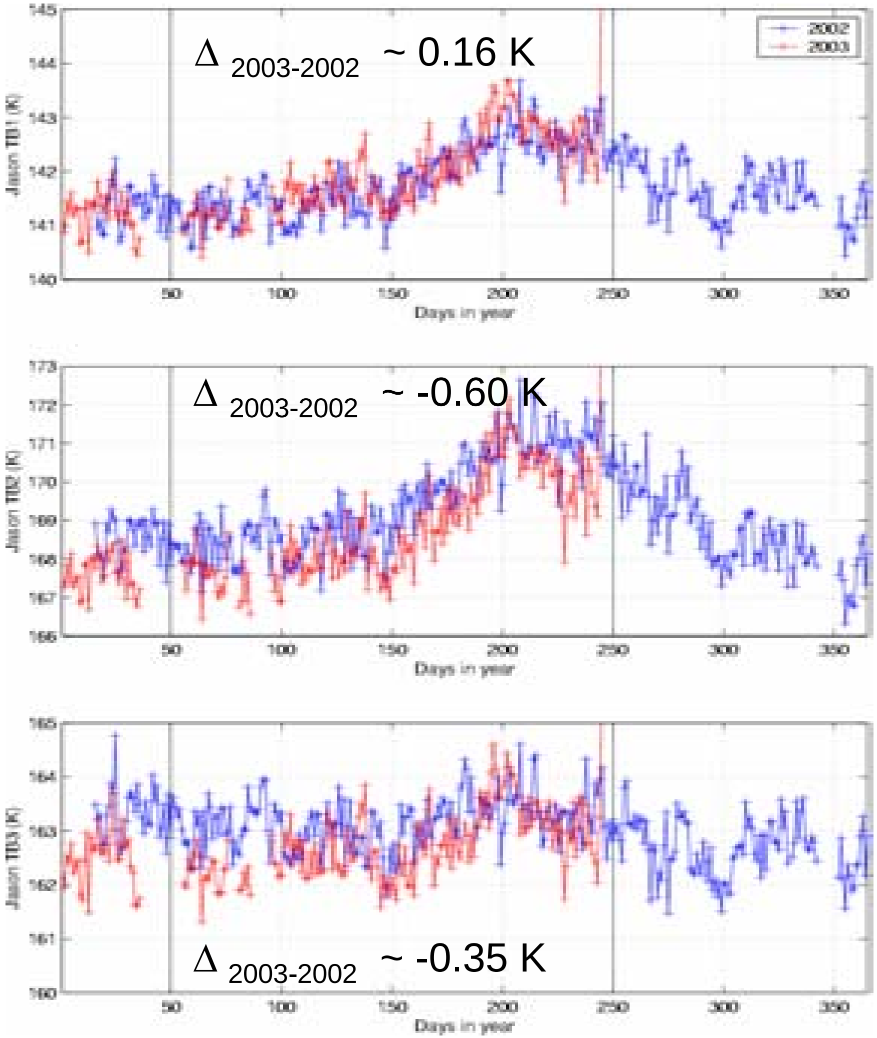
TB18-TB24



TB18-TB34

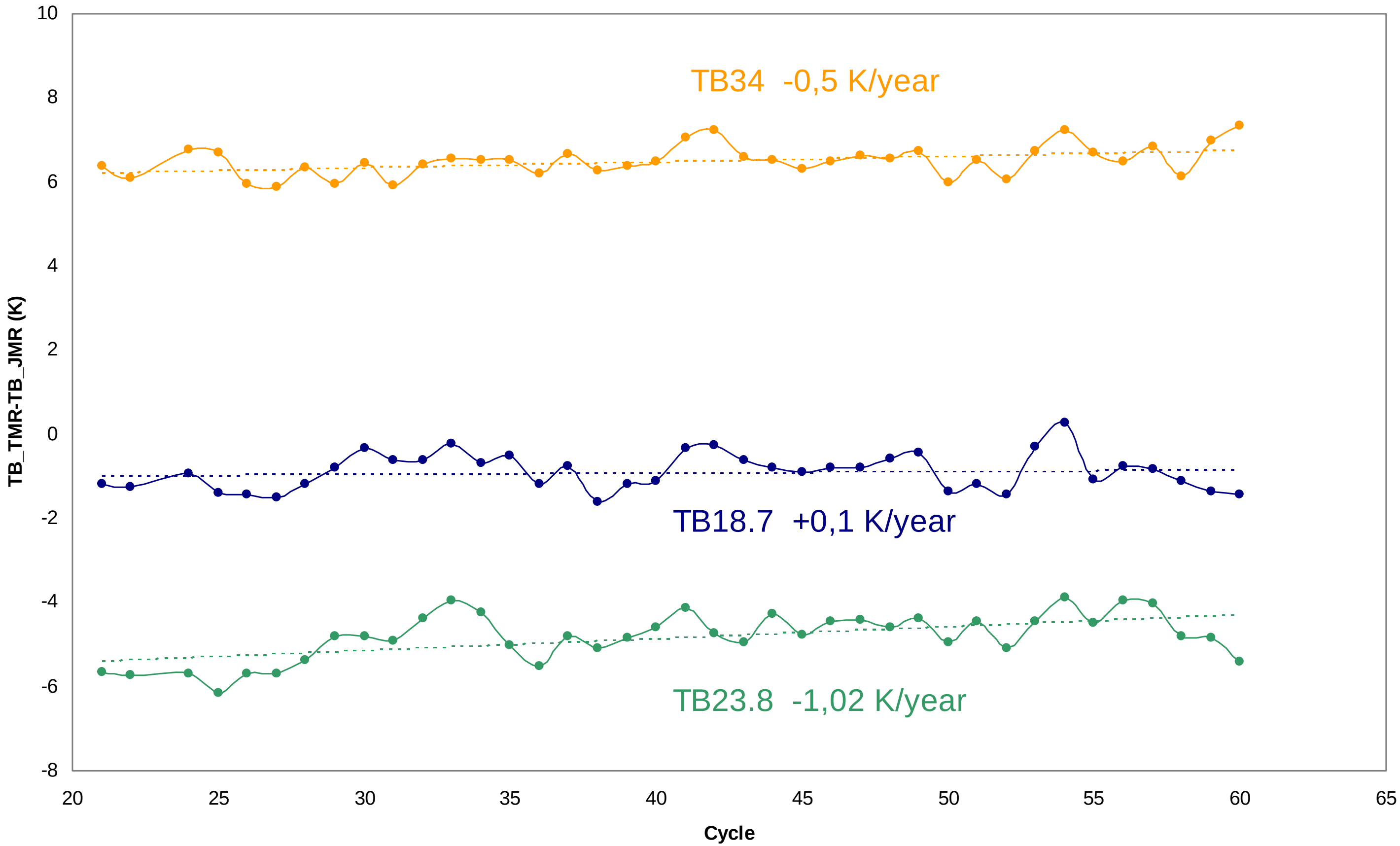


TB24-TB34

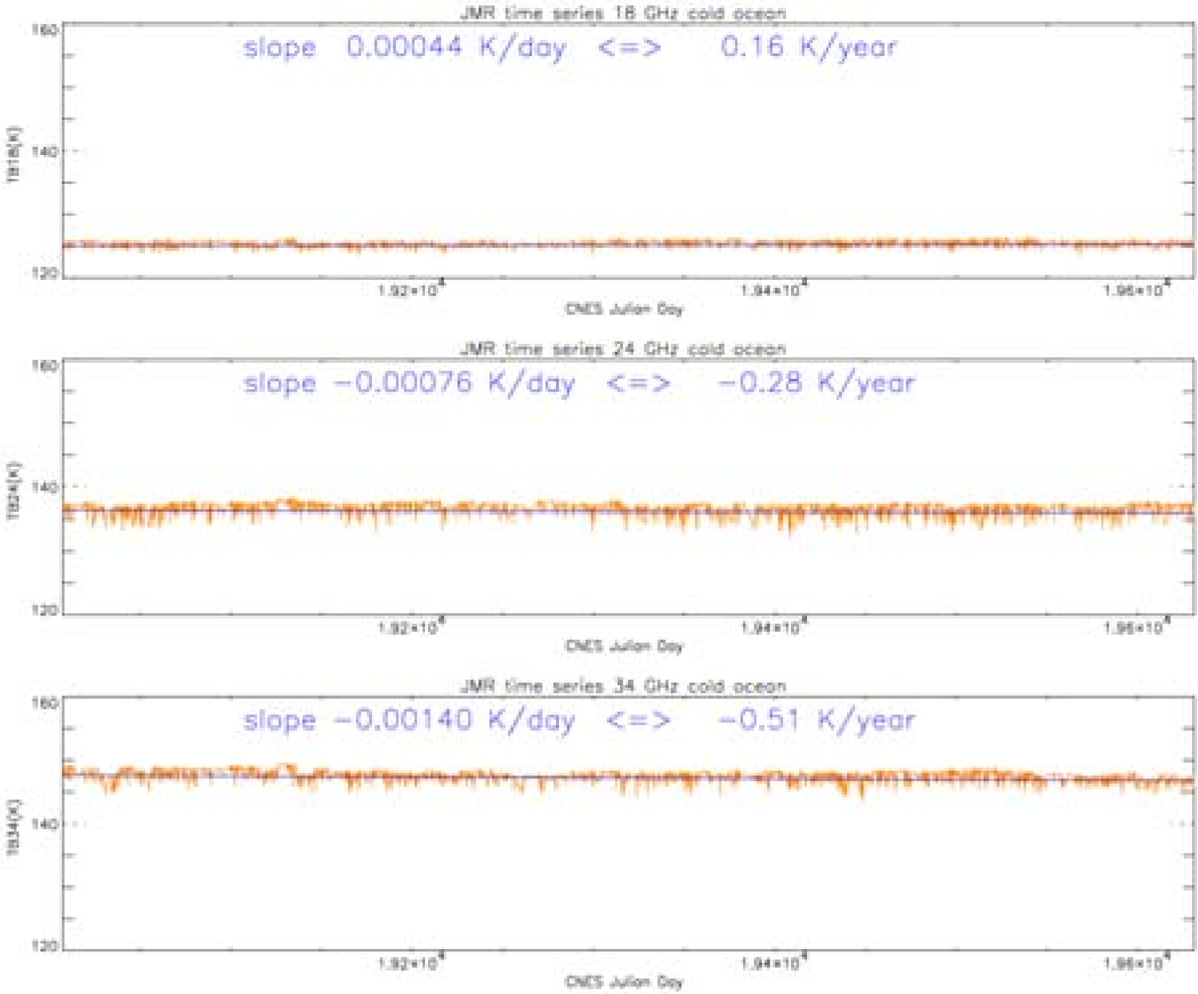


Comparison between 2002 and 2003 : daily mean for each TB

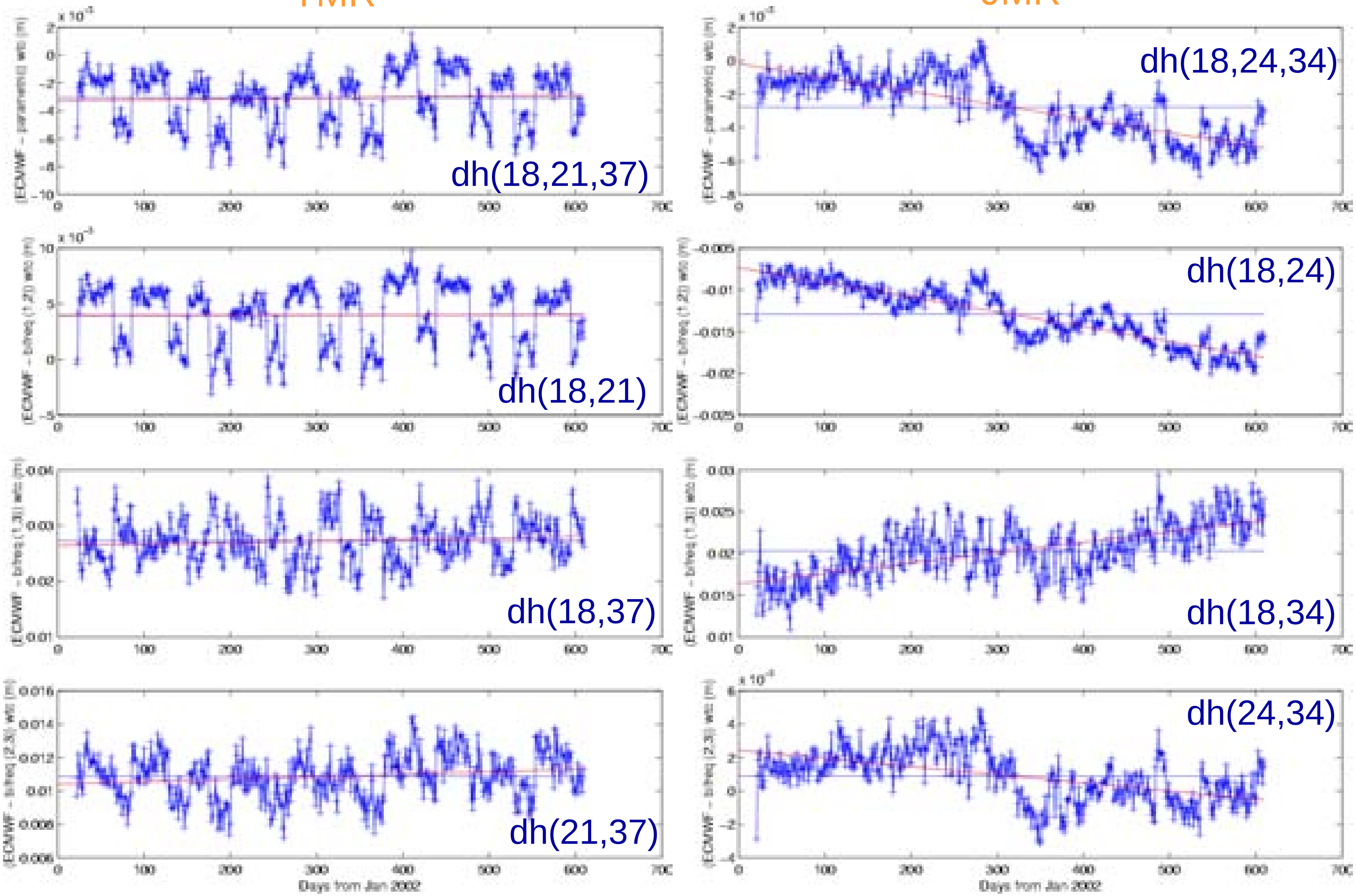
Mean difference per cycle between TMR and JMR TBs at 1 hour cross-over points



Survey of the JMR coldest ocean points



TMR JMR


dh(18,21,37)
dh(18,24,34)
dh(18,21)
dh(18,24)
dh(18,37)
dh(18,34)
dh(21,37)
dh(24,34)
Days from Jan 2002
Days from Jan 2002

3 different estimations of drifts in K/year

	TB18.7	TB23.8	TB34
Daily mean *global*	+0.2	-0.6	-0.4
Daily differences with TMR X_1h *very high latitudes > 60°*	+0.1	-1.0	-0.5
Ocean coldest points *high latitudes > 40°*	+0.2	-0.3	-0.5

Mean drifts on the 3 brightness temperatures
produce expected behaviour of the bi-frequency algorithms

Conclusions

TMR

- the 18 GHz drift correction degrades the recomputed product versus radiosonding measurements
- strong yaw state dependence
- TMR brightness temperatures appear very stable in time since Jason launch

JMR

- products comparison with radiosonde measurements shows a quite good agreement
- descending ramp on dh during October and November 2002 (cycles 27 to 32)
- since this ramp, the yaw state dependence reappears
- at least TBs of channels 2 and 3 are decreasing

⇒ Instrumental parameters survey is needed to explain these different features