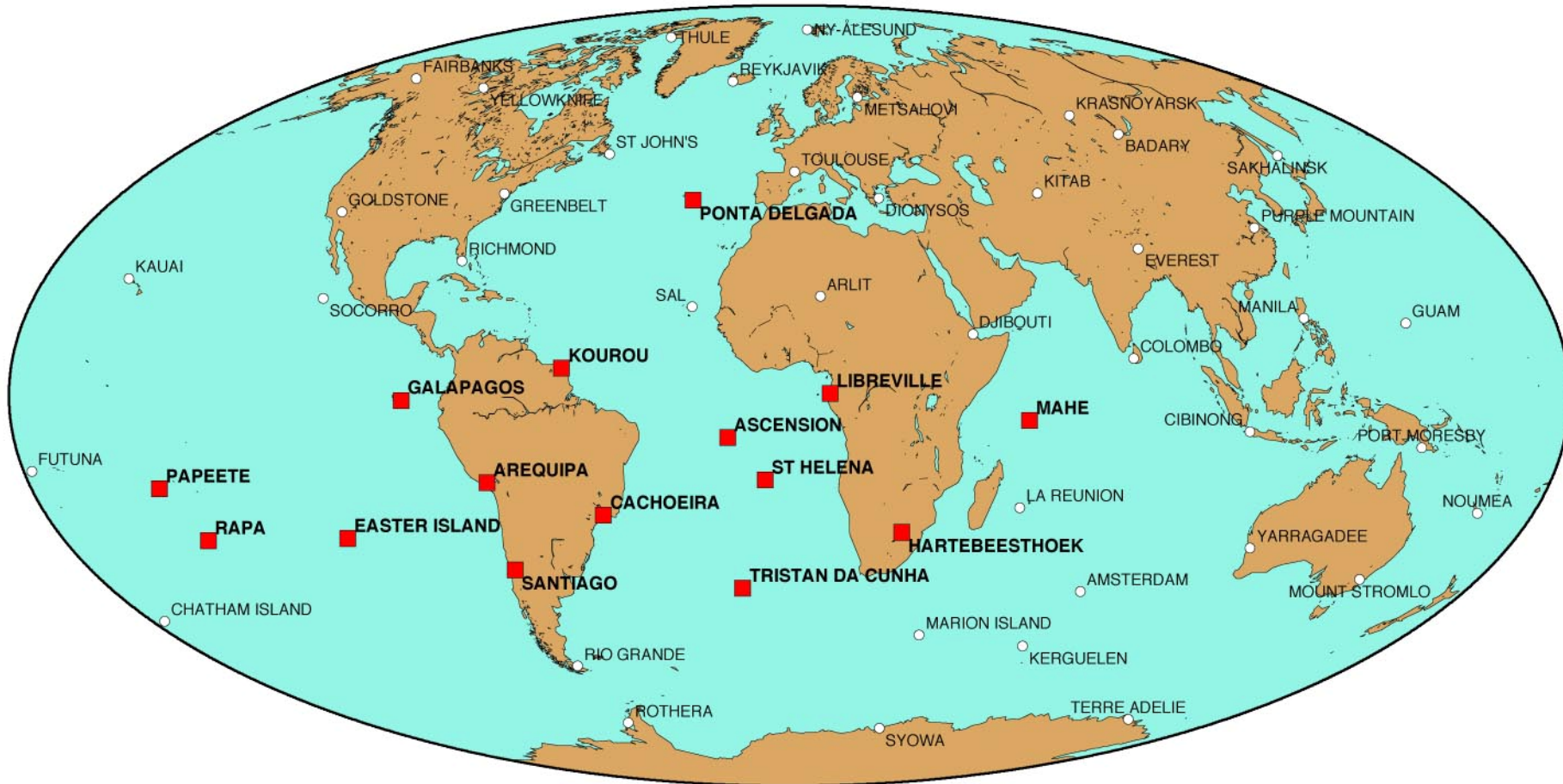

DORIS/JASON data

What is happening in the South Atlantic Anomaly region?

P. Willis (IGN/JPL), B. Haines (JPL),
Y. Bar-Sever (JPL), L. Young (JPL)

SUMMARY

- Problems found with DORIS/JASON data
 - DORIS tracking stations weekly positioning
 - Master stations clock monitoring
 - Precise Orbit Determination
(with or without DORIS/SAA data)
- Physical explanation
 - JASON clock behavior in the SAA region
 - Does it explain the above mentioned problems?
- Conclusions



Map from H. Fagard

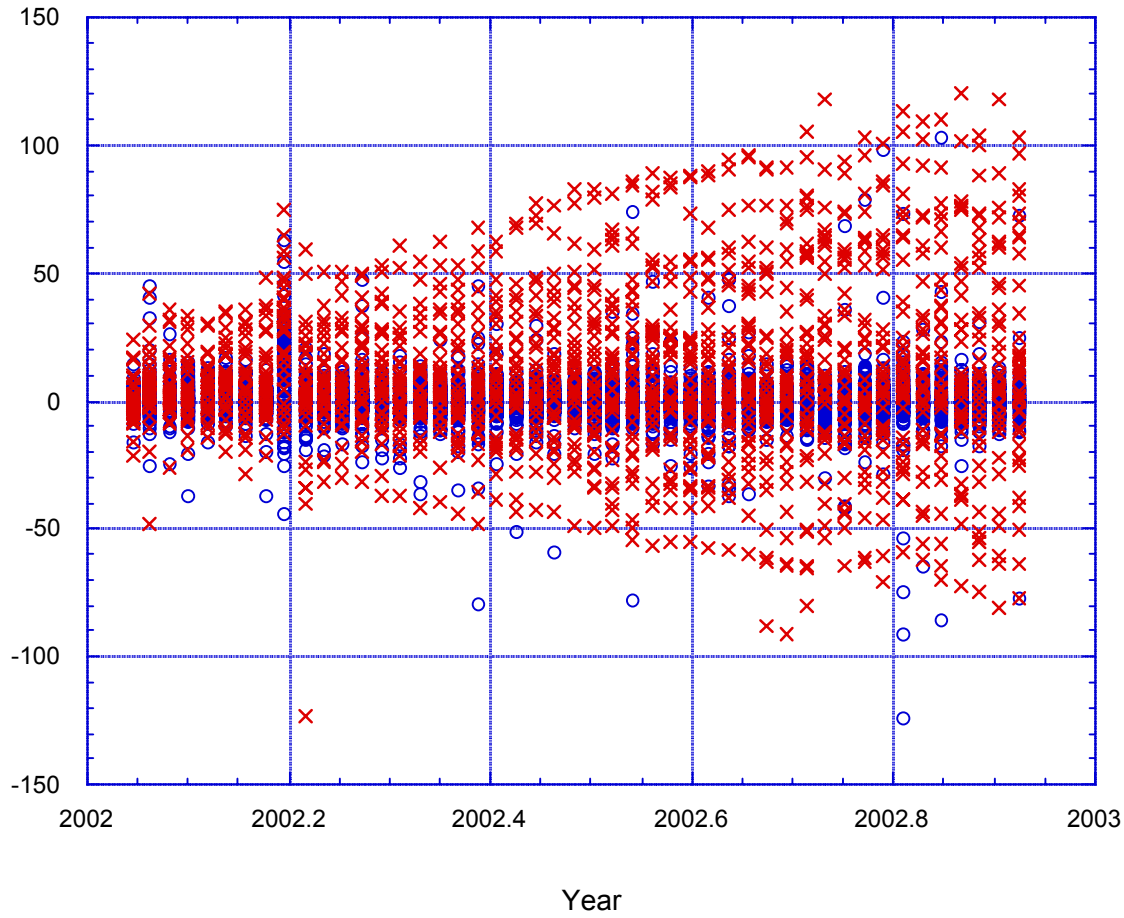
Marne-la-Vallee
Fevrier 2003

IDS Analysis Workshop

3/15

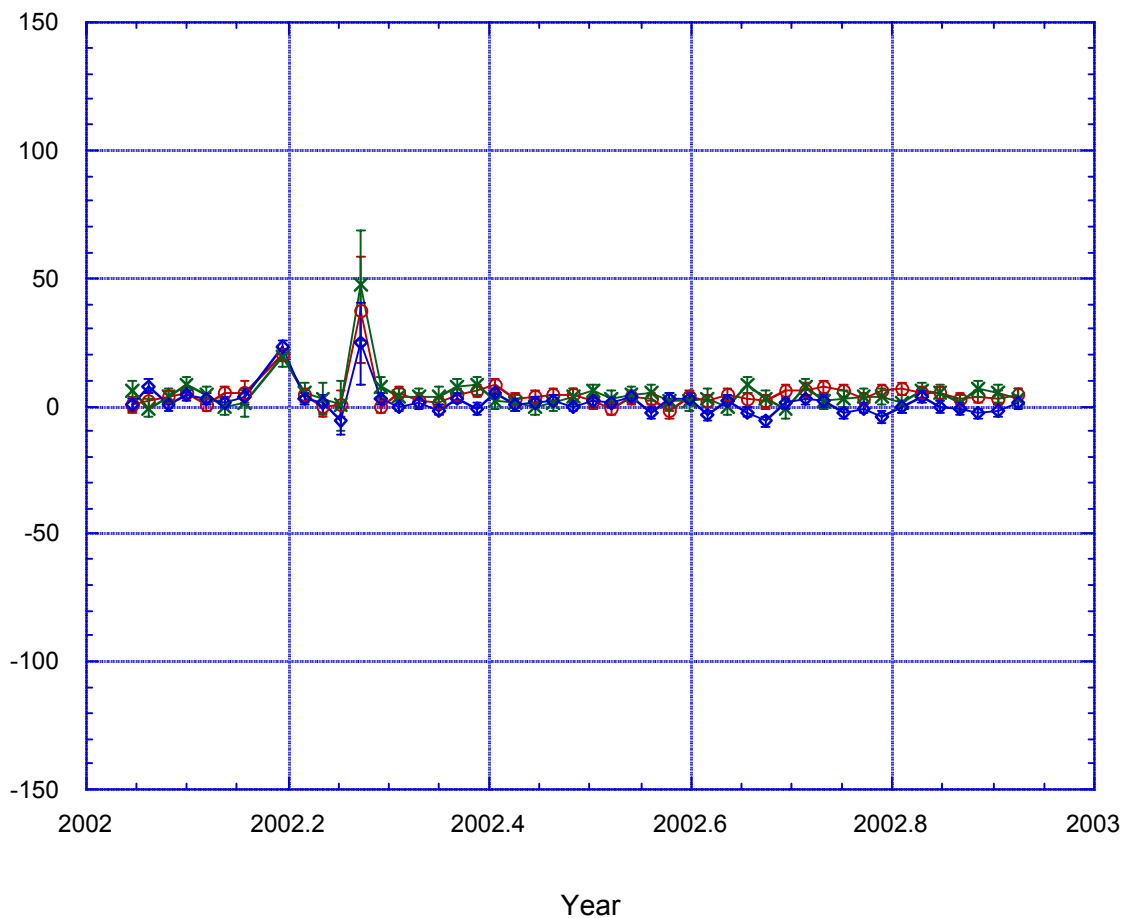
- Station outside SAA
- × Station inside SAA

DORIS/JASON weekly station positioning (latitude, longitude, altitude) cycle 1 to 33 = January 15 - December 8, 2002



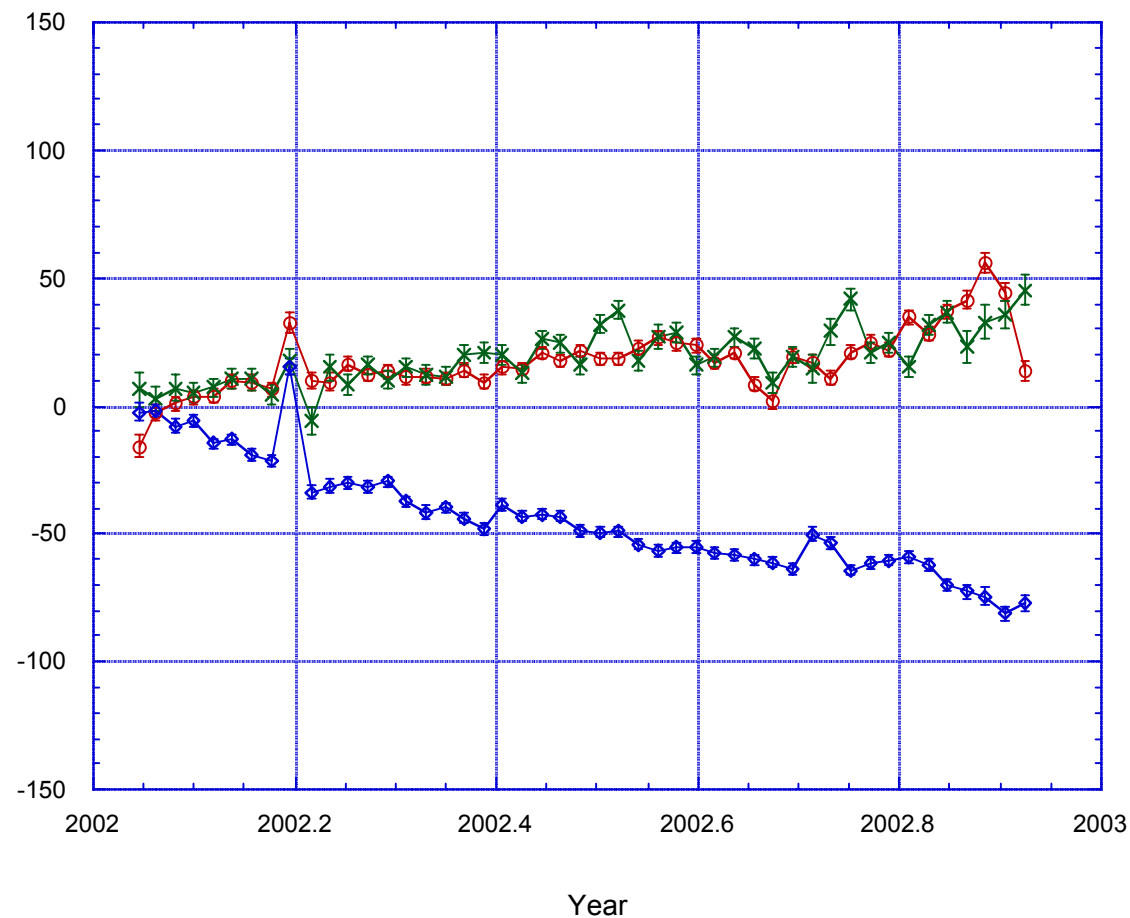
- YARB vertical
- × YARB longitude
- ◇ YARB latitude

DORIS/JASON weekly point positioning cycle 1 to 33 (Jan 15 - October 8, 2002) station Yaragadee (YARB)



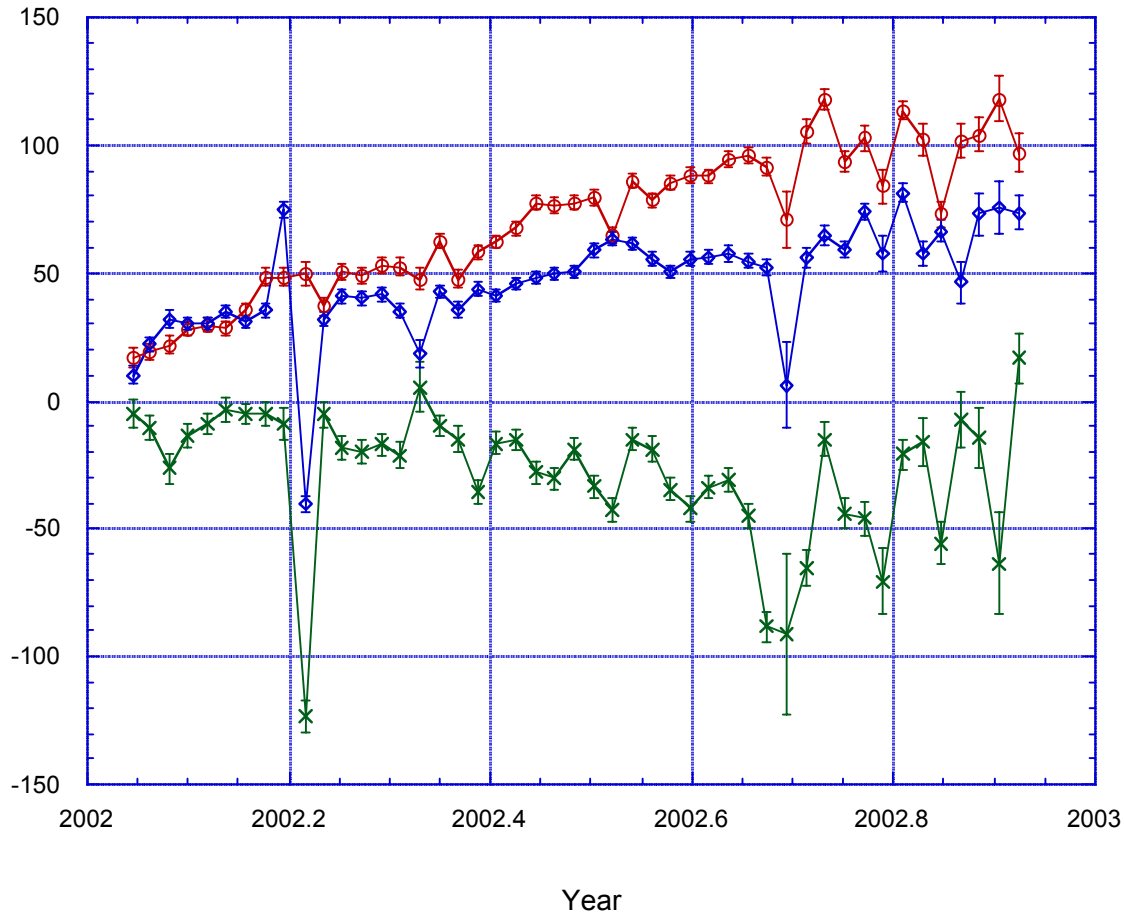


**DORIS/JASON weekly point positioning
cycle 1 to 33 (Jan 15 - October 8, 2002)
station Kourou (KRUB/KRVB)**



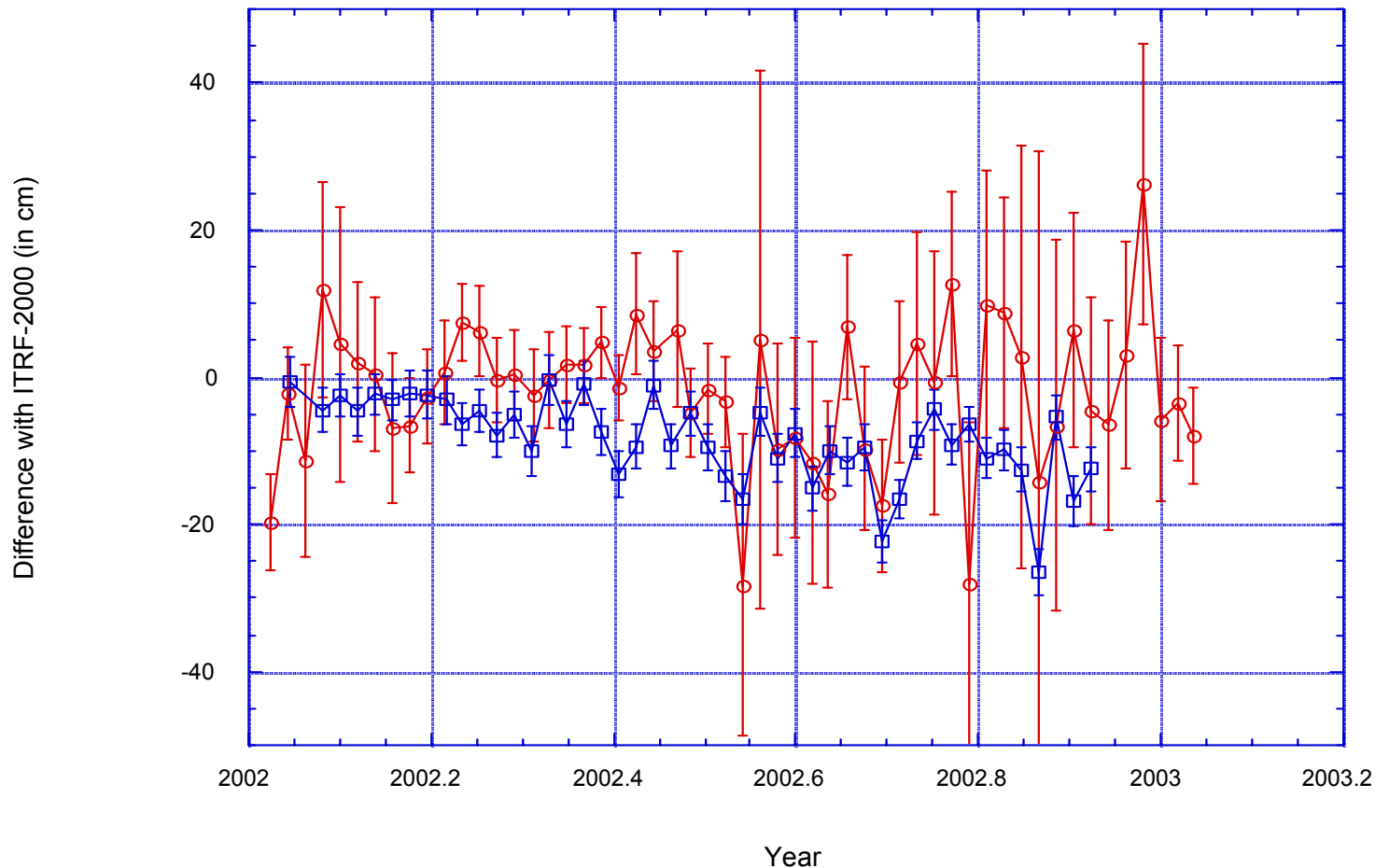
- CACB vertical
- × CACB longitude
- ◇ CACB latitude

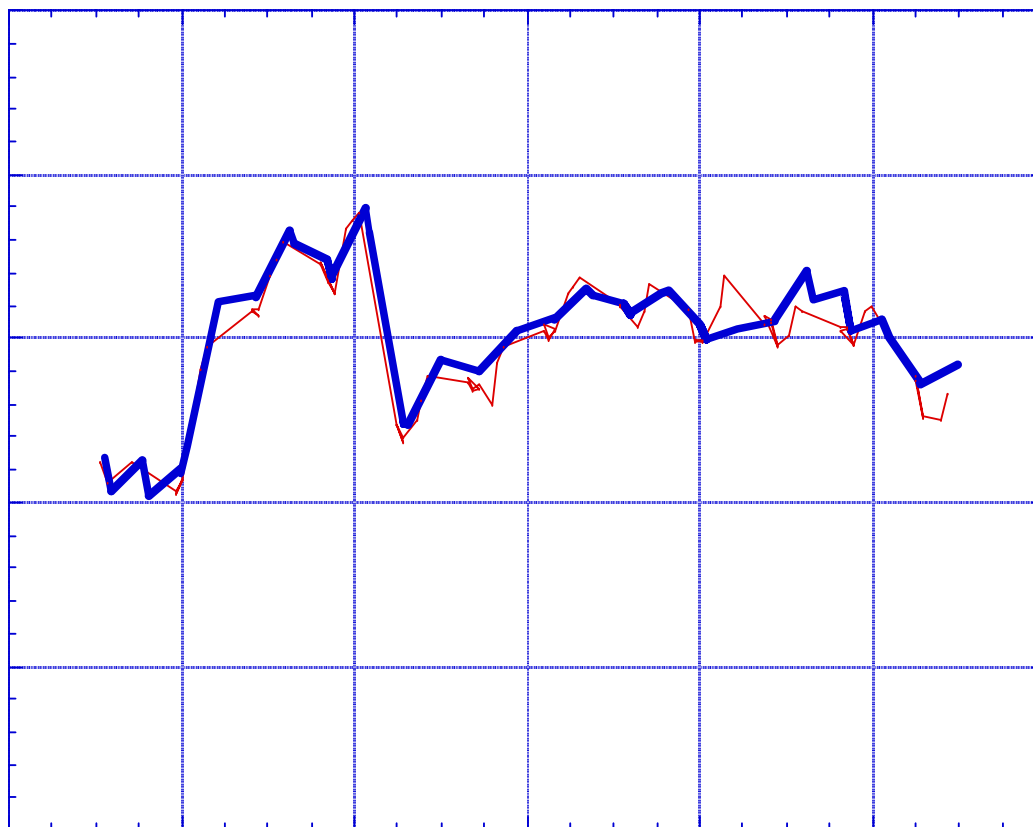
DORIS/JASON weekly point positioning cycle 1 to 33 (Jan 15 - October 8, 2002) station Cachoeira (CACB)

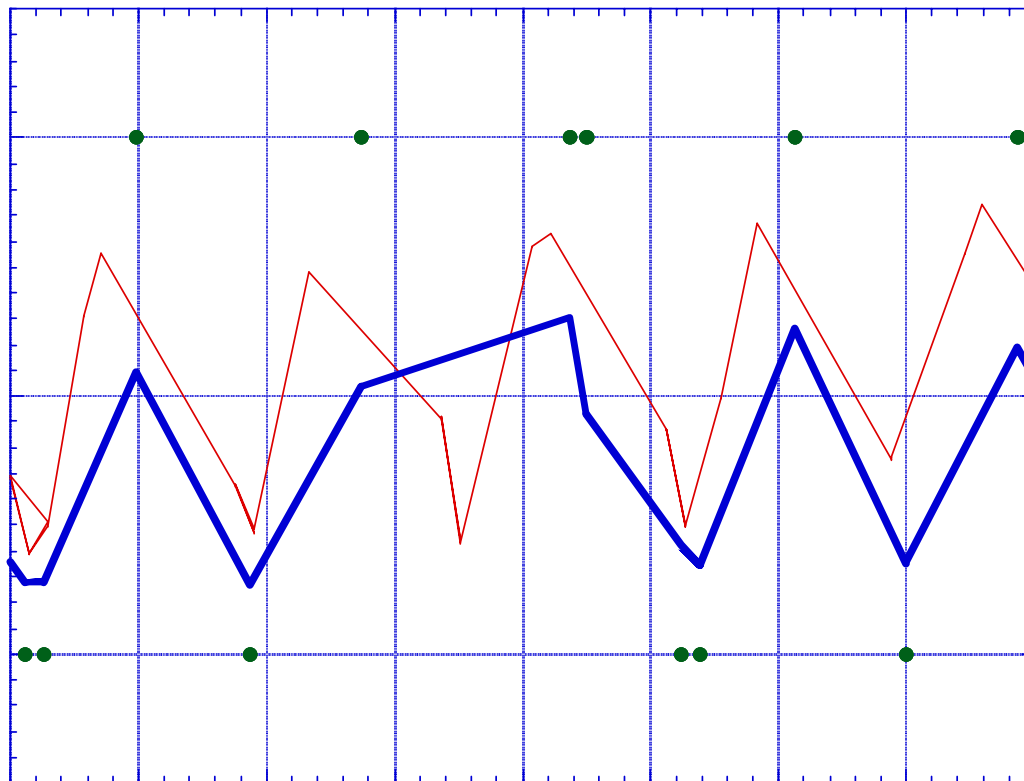


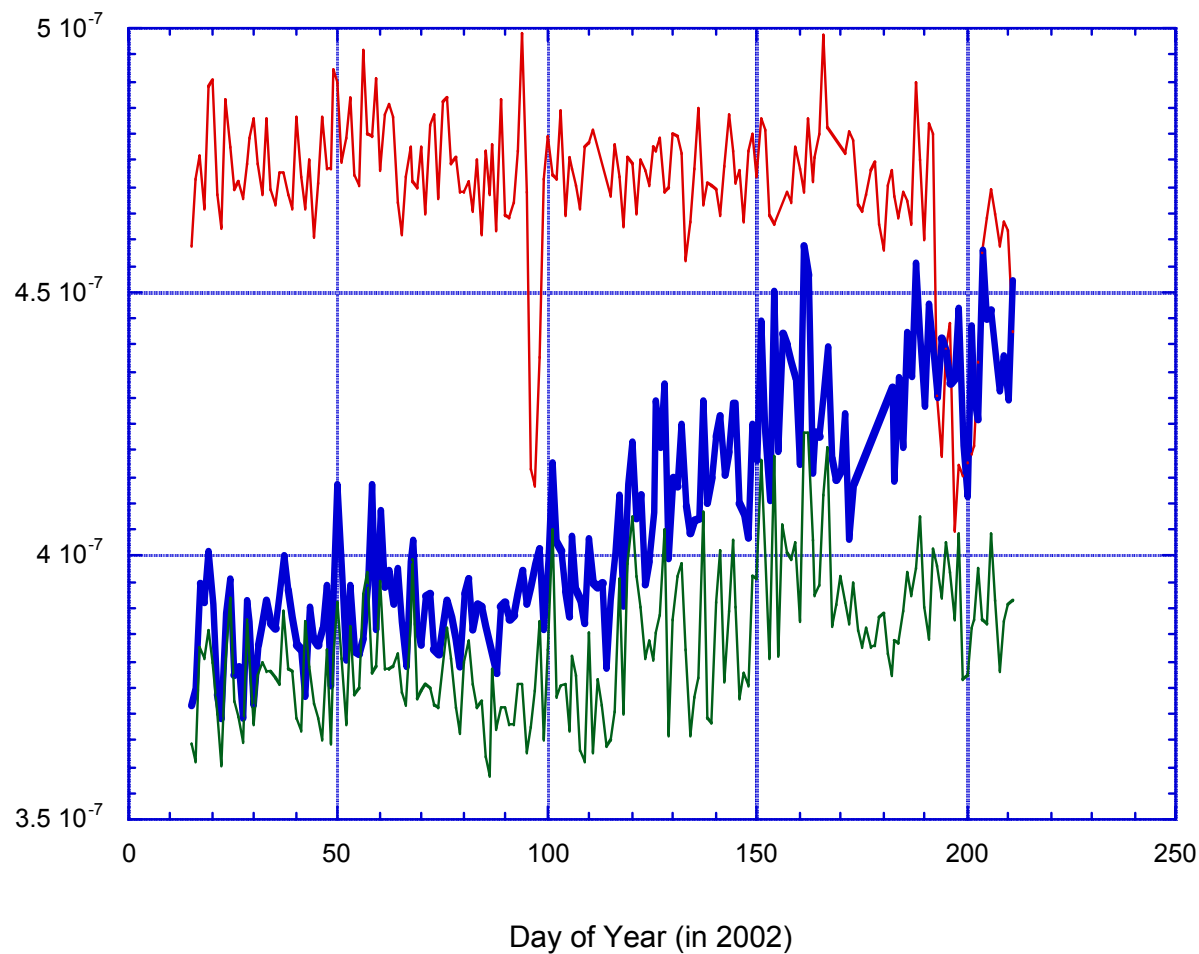
—○— PDMB vertical (TOPEX data)
—□— PDMB vertical (JASON data)

1-satellite station weekly positioning station Ponta Delgada (PDMB)

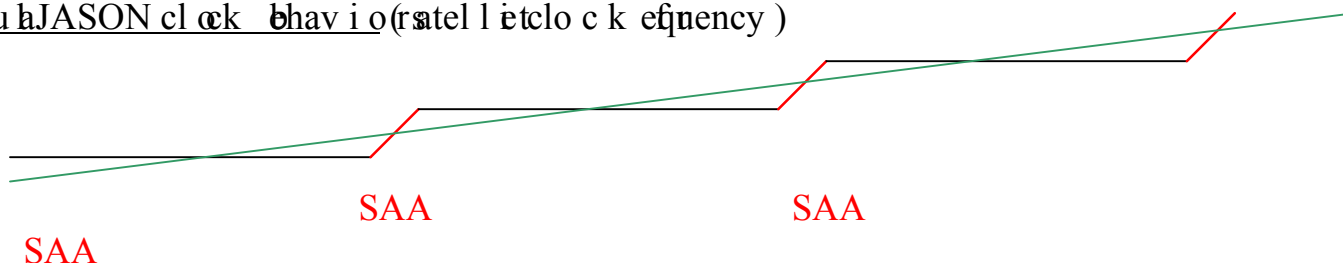






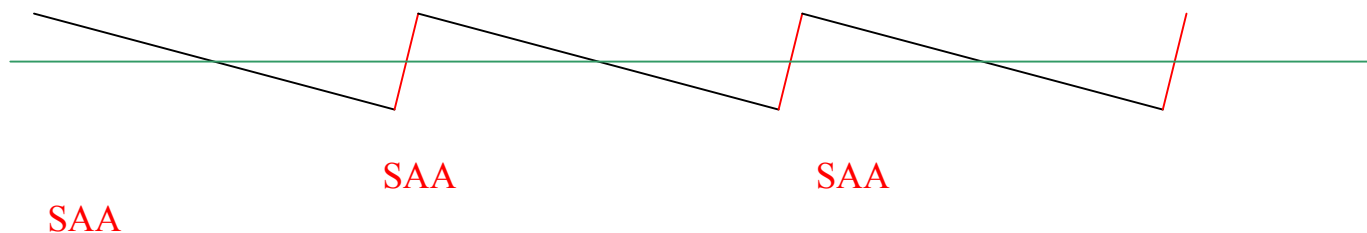


Actual JASON clock behavior (satellite clock frequency)



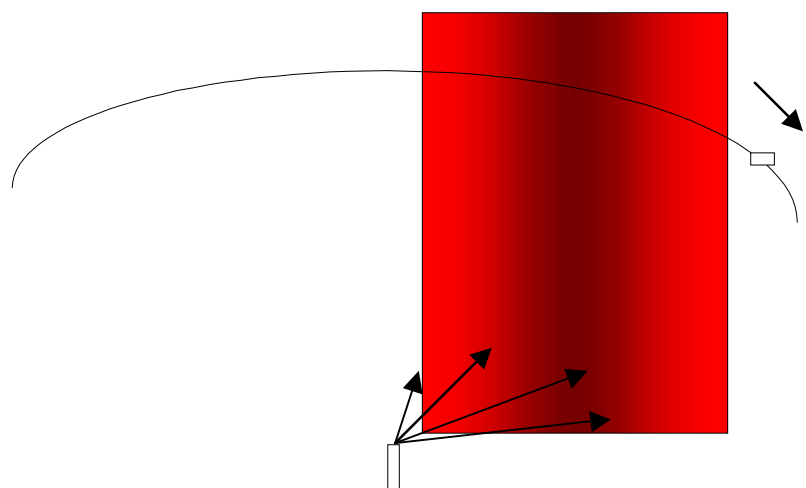
JASON satellite clock DORIS data

(after removal of a long-term polynomial by CNES in their processing)



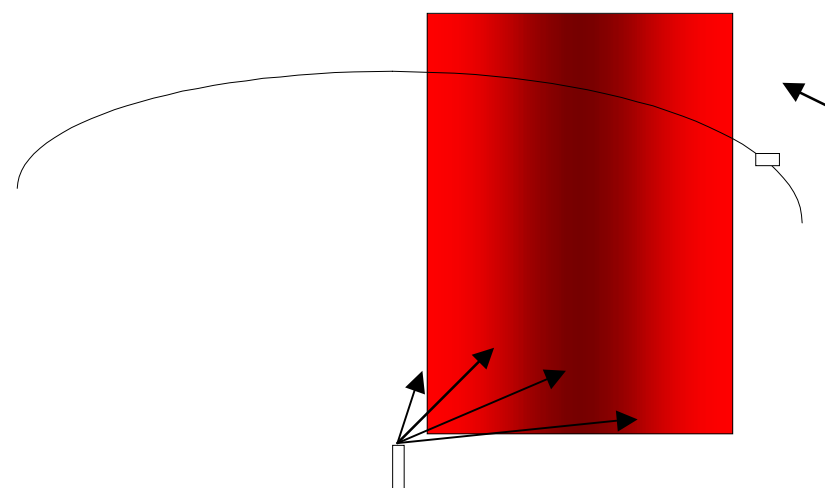
Station at the boundary of the SAA region

North



DESCENDING PASS AT KORO U

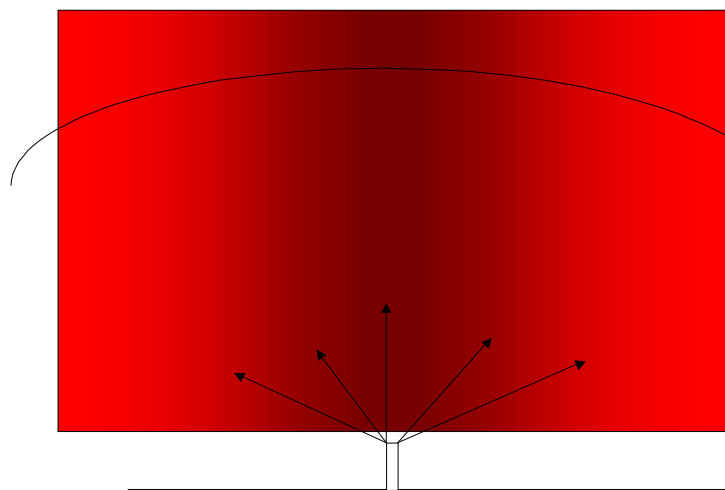
North



ASCENDING PASS AT KORO U

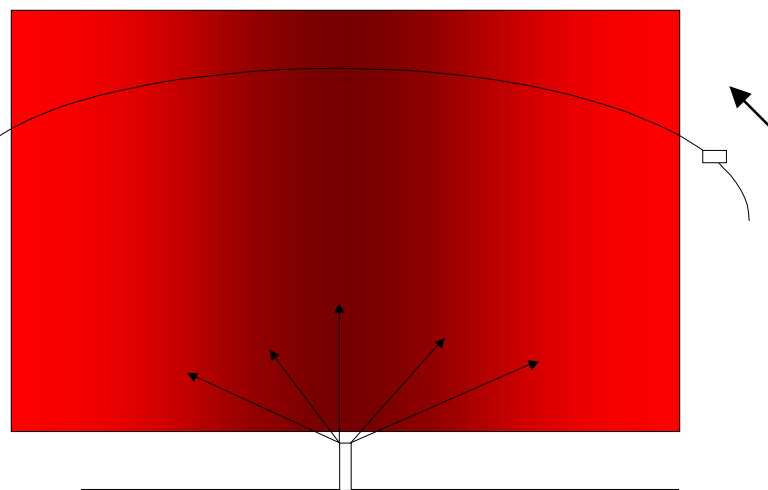
Station in the middle of the SAA region

North



DESCENDING PASS AT CACHOERA

North



ASCENDING PASS AT CACHOERA

CONCLUSIONS

- Problems found with JASON/DORIS data can be explained by radiation effects on on-board clock in the SAA region
- Problems presently are getting worse almost linearly with time (January - December 2002)
- Future work
 - New preprocessing ?
 - New estimation strategy (with or without the SAA data)?