

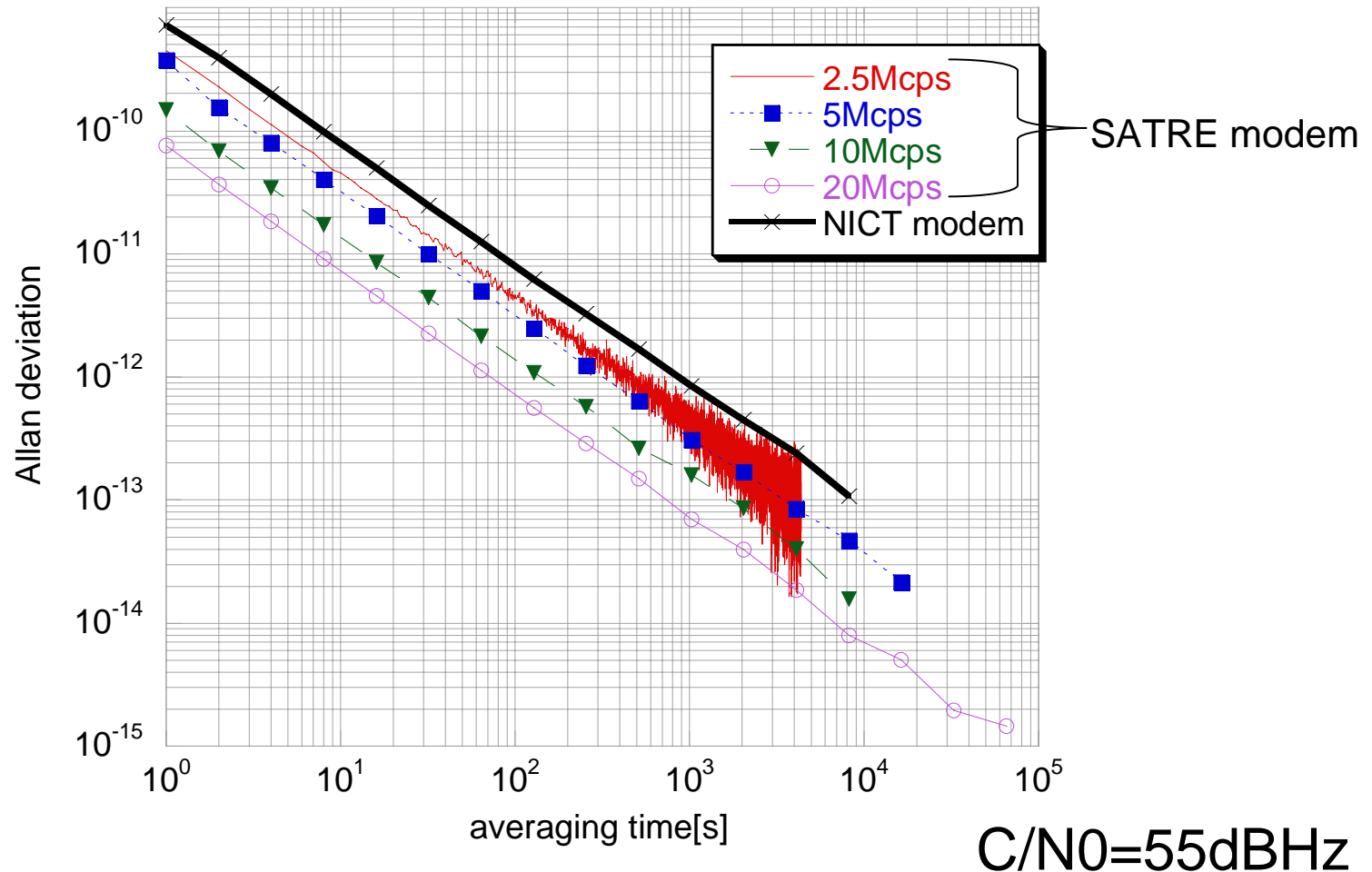
Performance evaluation of NICT modem - comparison with SATRE modem-

- * Specification
- * Comparison measurement results
 - zero baseline
 - long baseline 1
 - long baseline 2
- * Conclusion

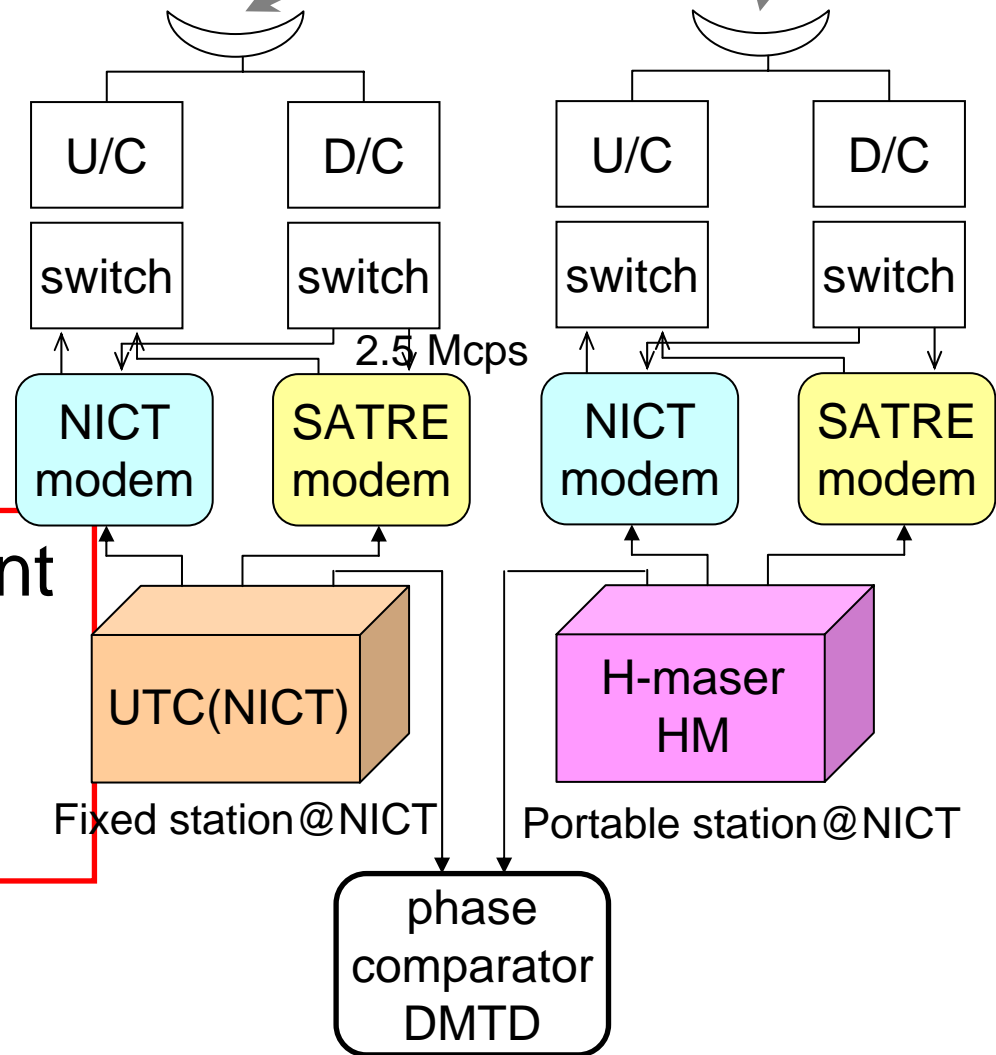
Specification

	SATRE modem	NICT modem
No. of Tx channels	1	2
No. of Rx channels	Max 3	8
Chip rate	0.5/1/2.5/5/10/20 Mcps	2.0475 Mcps
IF frequency	70 MHz \pm 18 MHz	70 MHz \pm 500 kHz
BW	1.5 * Chip rate(-6dB)	2.2 MHz(-3dB)
Measurement rate	1 Hz	1 Hz
Superimposed data rate	256 bps(High rate)	500 bps
C/N0	> 44dB \cdot Hz	> 45dB \cdot Hz

Measurement precision



0 baseline measurement with NICT and SATRE modems



Time division measurement

- * xx:10-xx:40 SATRE
- * xx:40-xx:10 NICT
- * via JCSAT-1B
- * 2006/8/29 – 2006/8/31

Results

Fig.1
Time difference of UTC(NICT)-HM

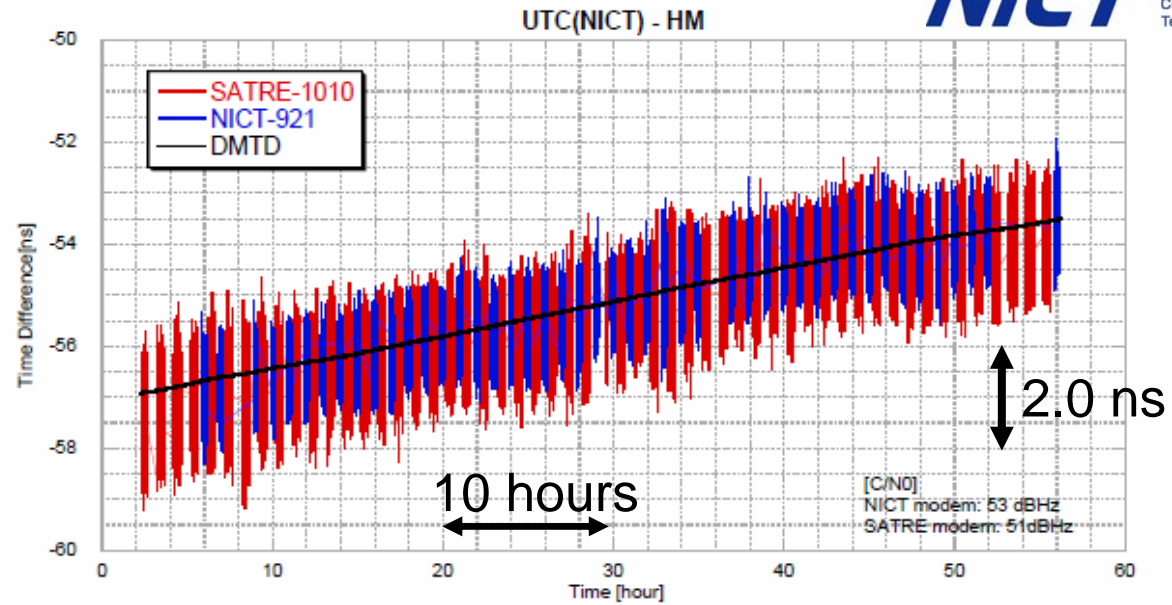
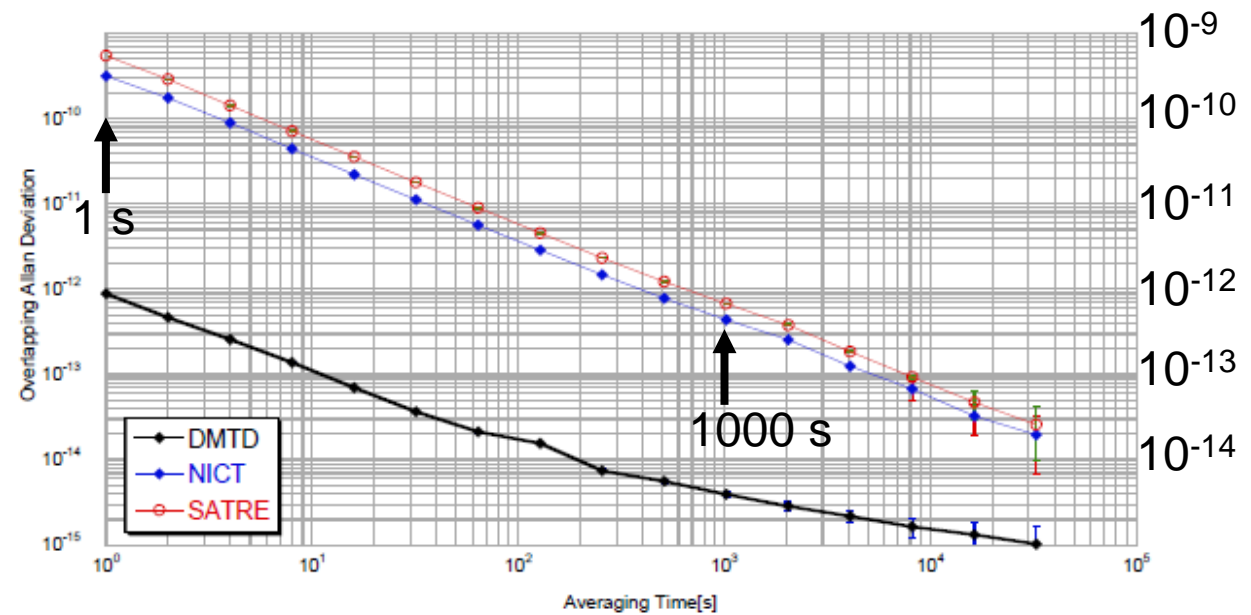


Fig.2
Frequency stabilities of UTC(NICT)-HM



Results

Fig.3
Double differences:
DMTD - TWSTFT

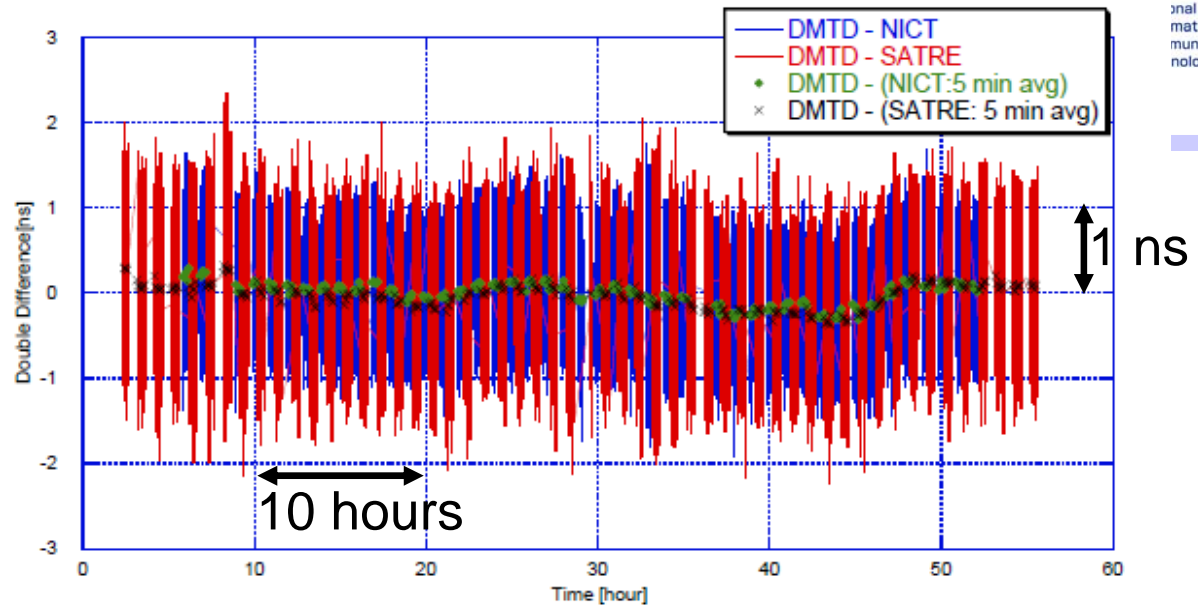
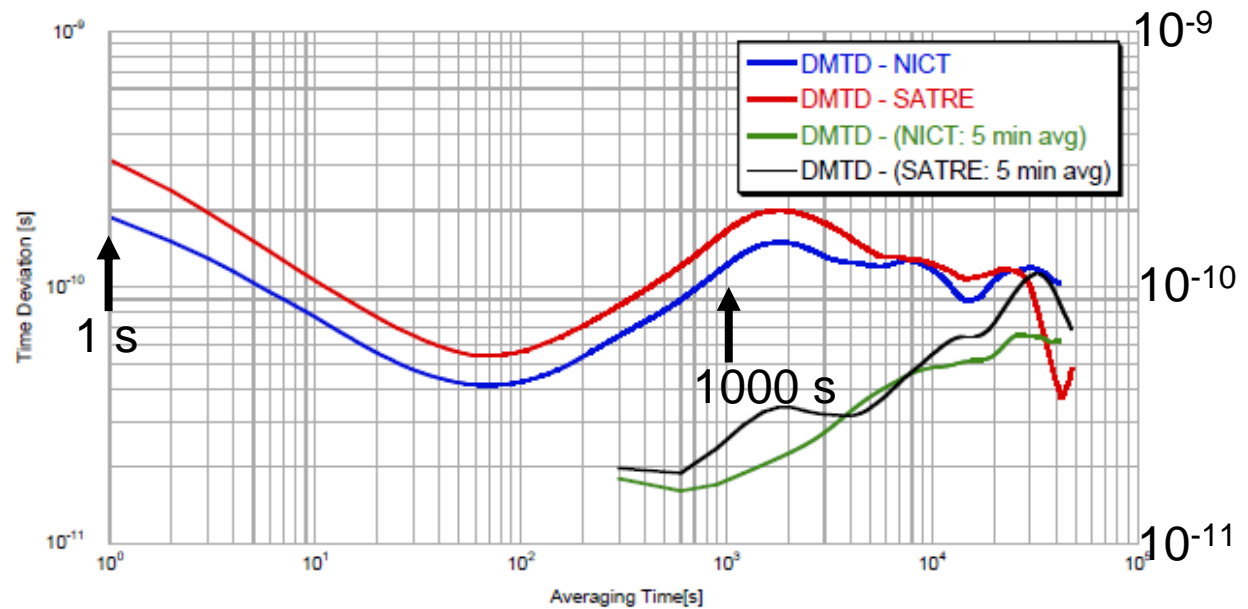


Fig.4
Time stabilities of
double difference



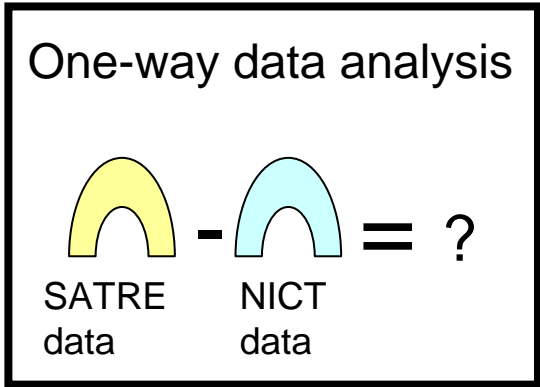
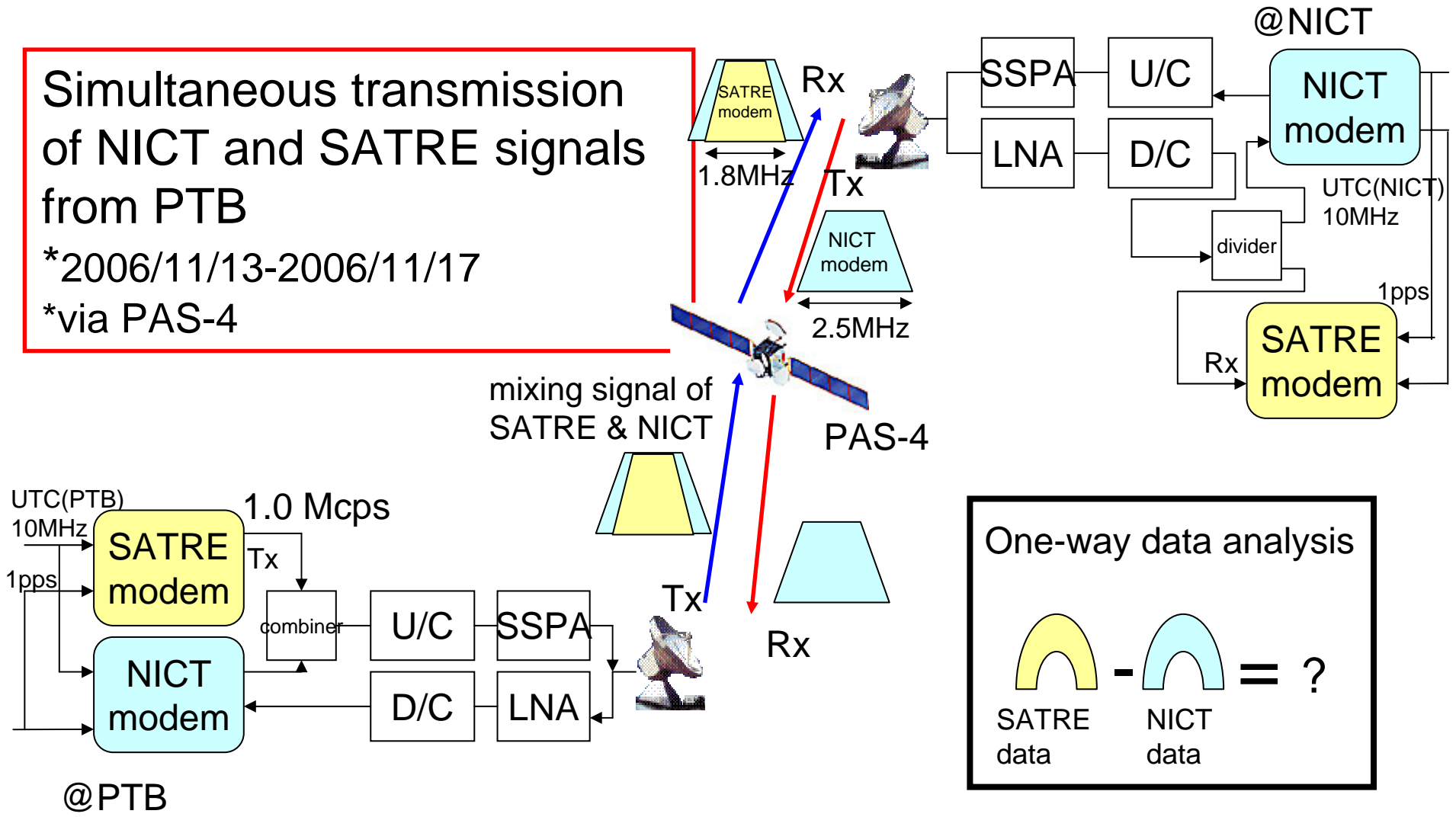
There was no clear difference between data by SATRE and NICT modems.

Long baseline measurement 1 with NICT and SATRE modems

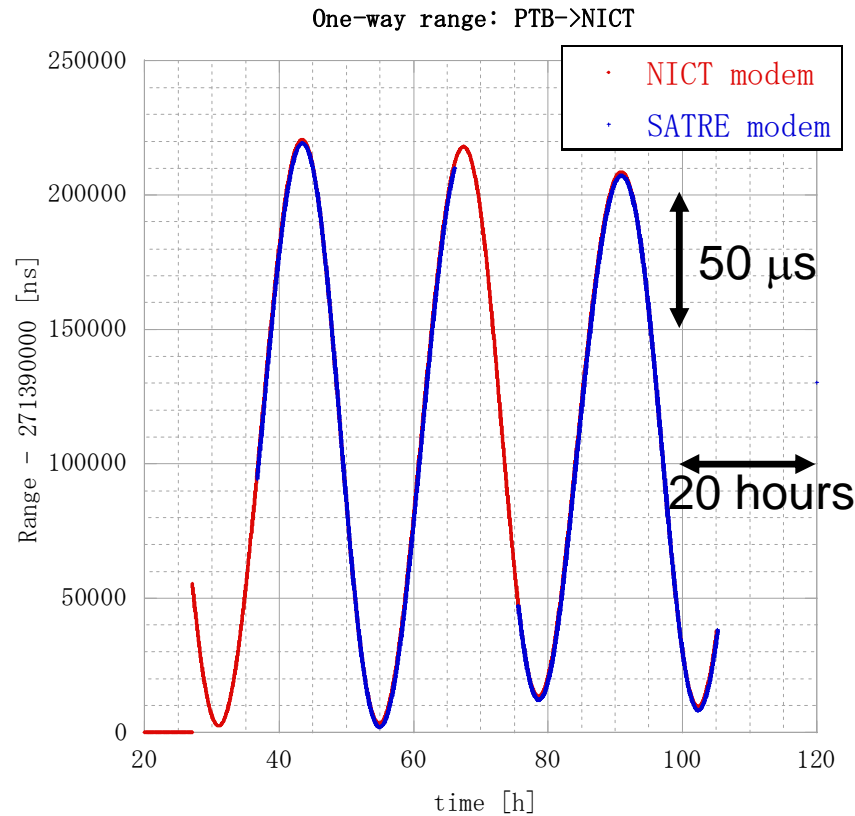
Simultaneous transmission of NICT and SATRE signals from PTB

*2006/11/13-2006/11/17

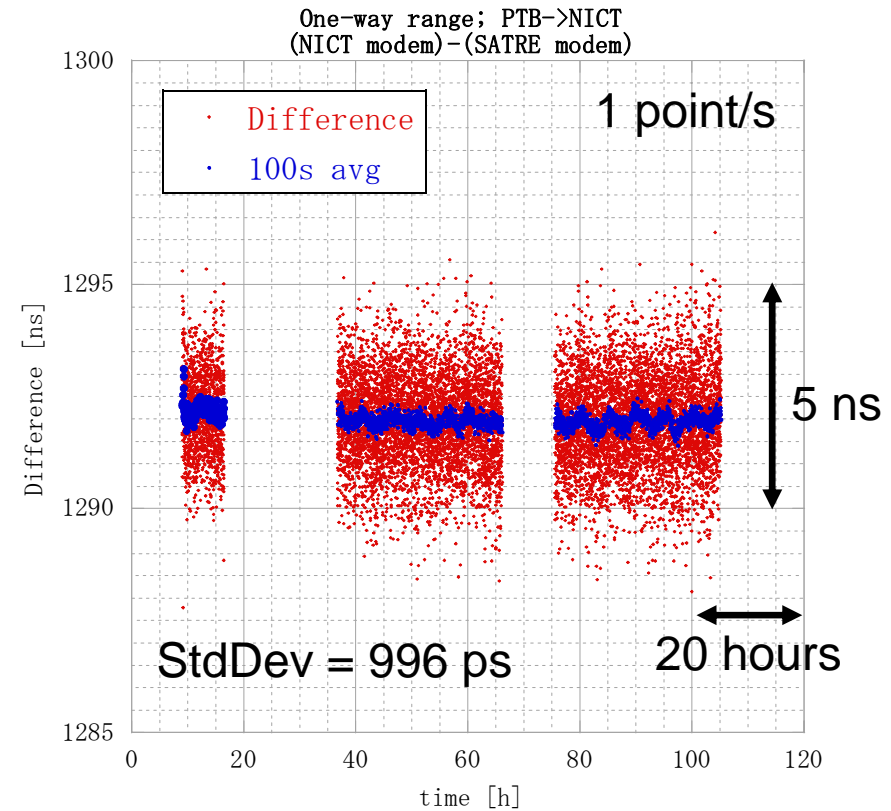
*via PAS-4



Results

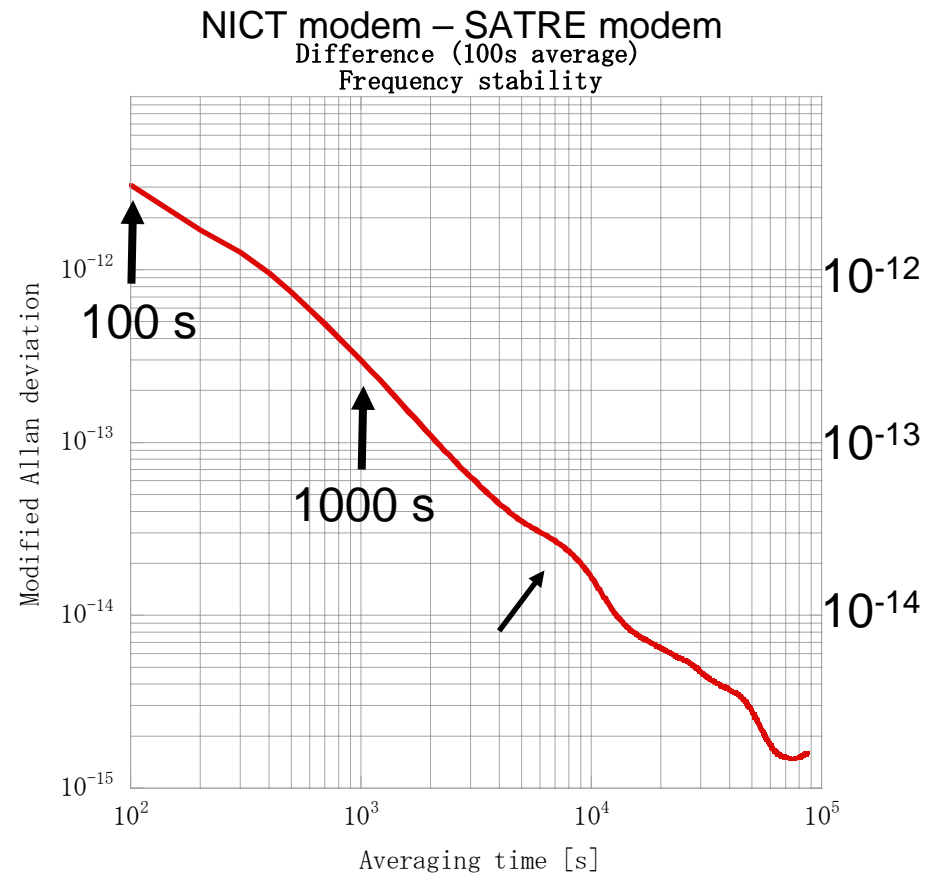
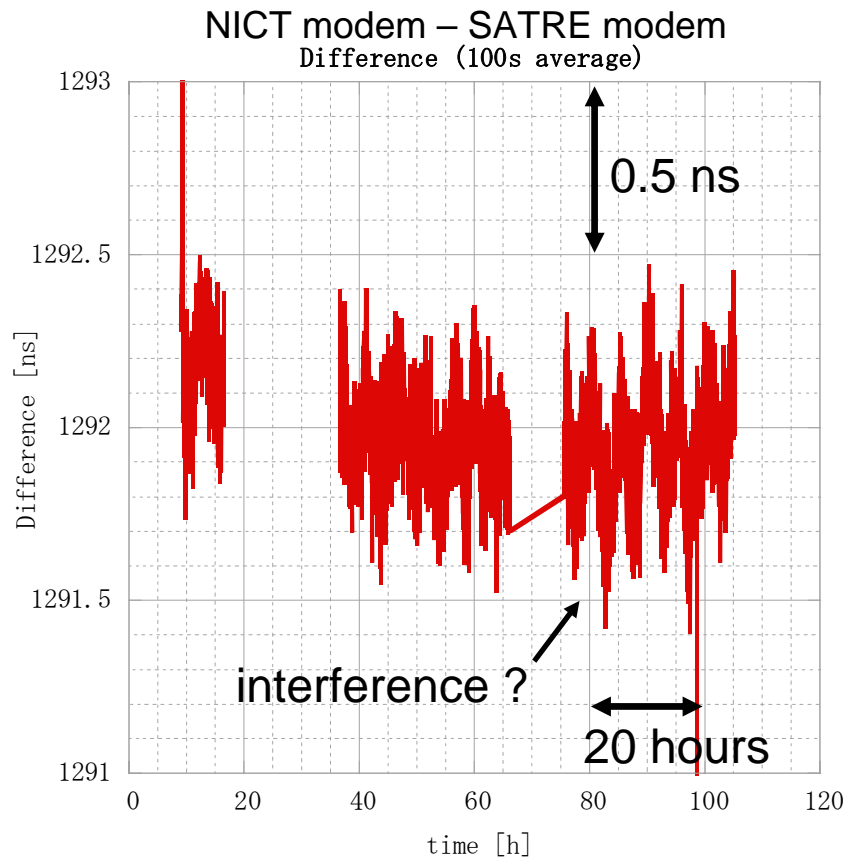


PTB->NICT Chip rate
 NICT modem ; 2.0475 Mcps
 SATRE modem ; 1.0 Mcps



PTB->NICT C/N0
 NICT modem ; 54 dBHz
 SATRE modem ; 51 dBHz(mean)

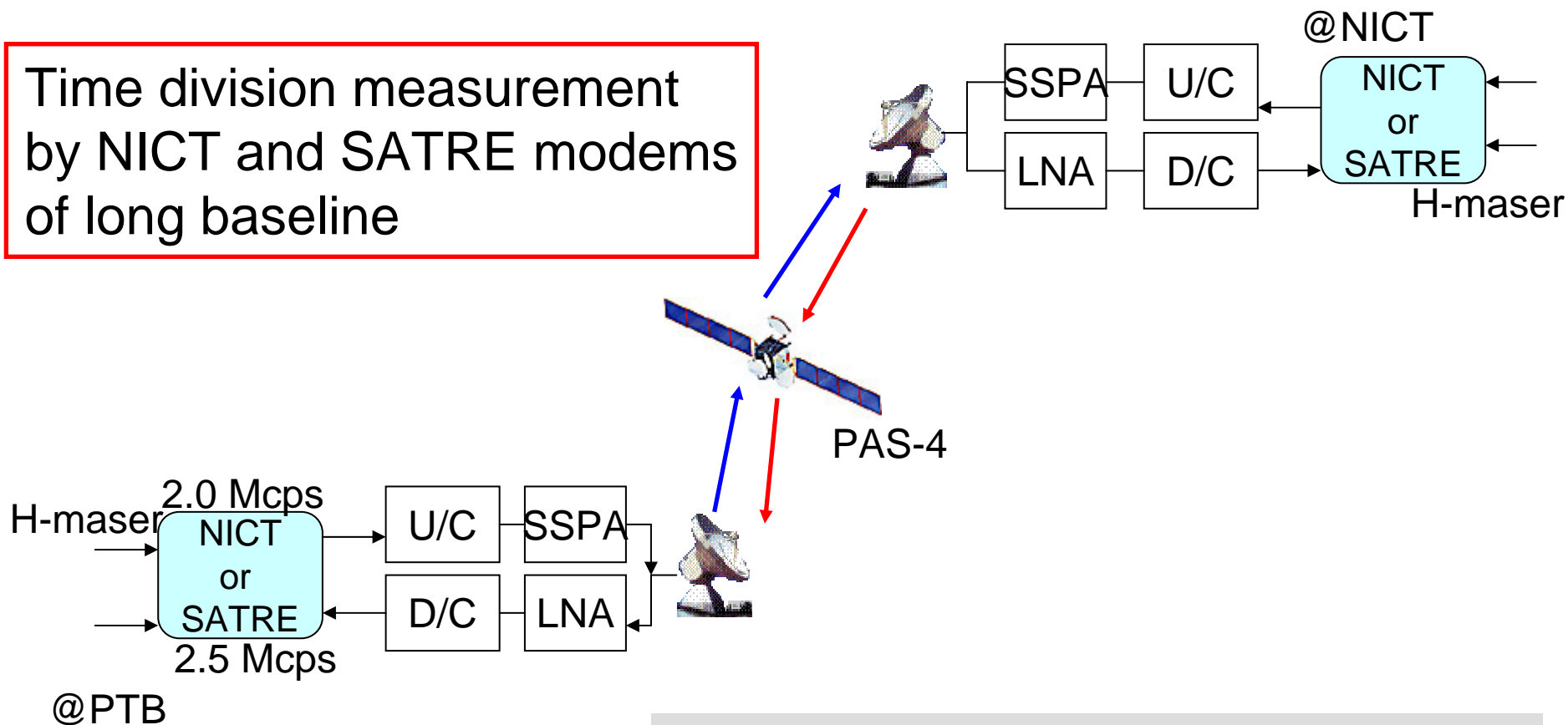
Results



There was no clear difference between data by SATRE and NICT modems.

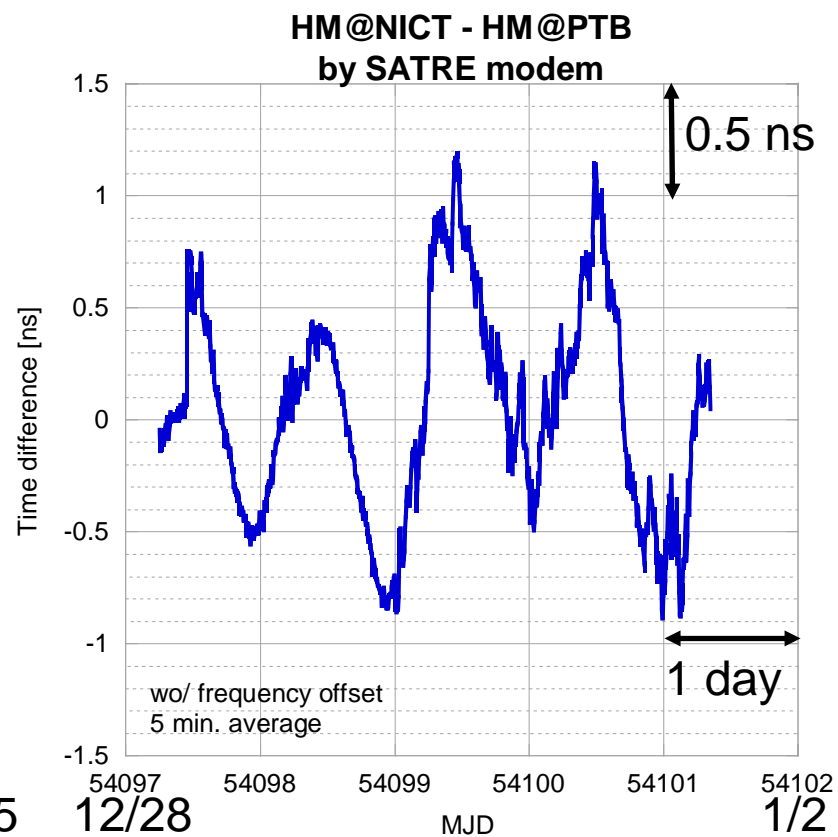
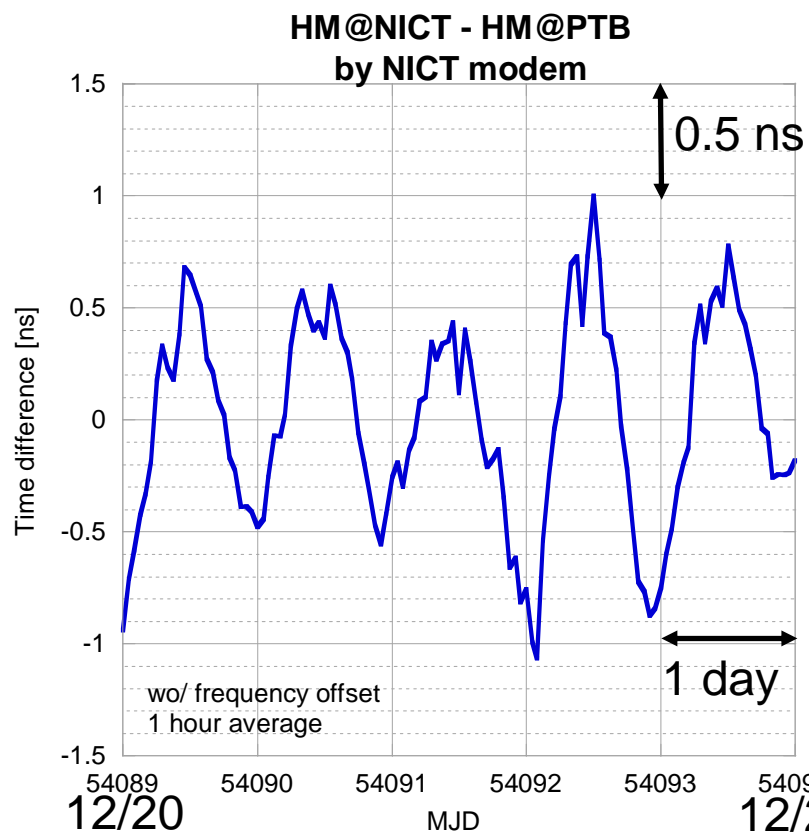
Long baseline measurement 2 with NICT and SATRE modems

Time division measurement by NICT and SATRE modems of long baseline



Measurement periods
 *2006/12/9-2006/12/25 by NICT modem
 *2006/12/28-2007/1/7 by SATRE modem

Results



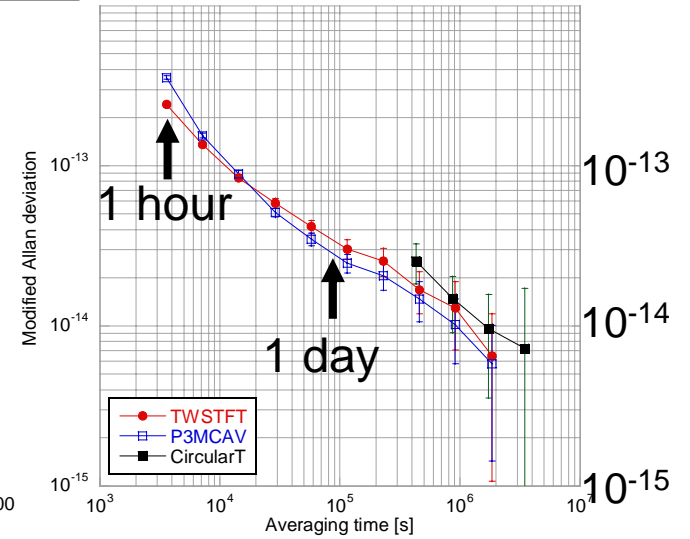
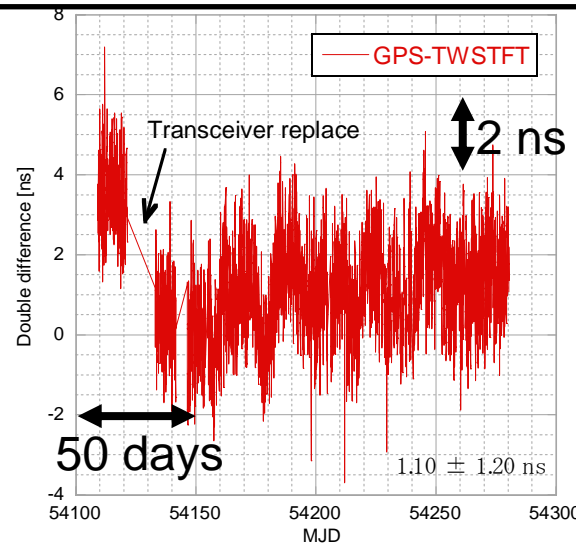
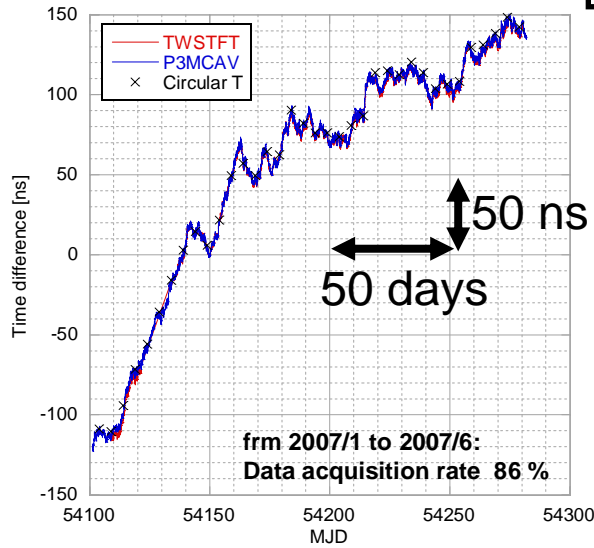
Diurnal variations were observed in data measured by both NICT and SATRE modems.

Studies of diurnal variation

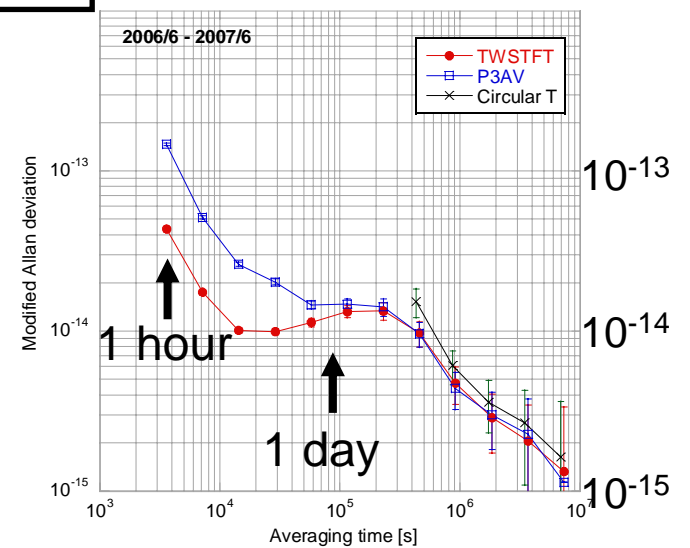
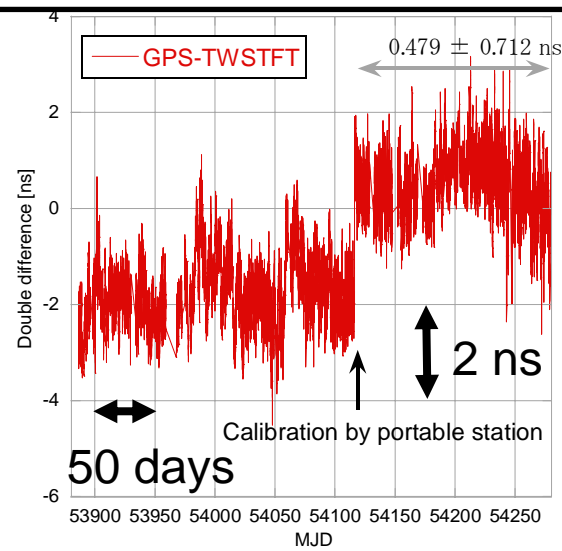
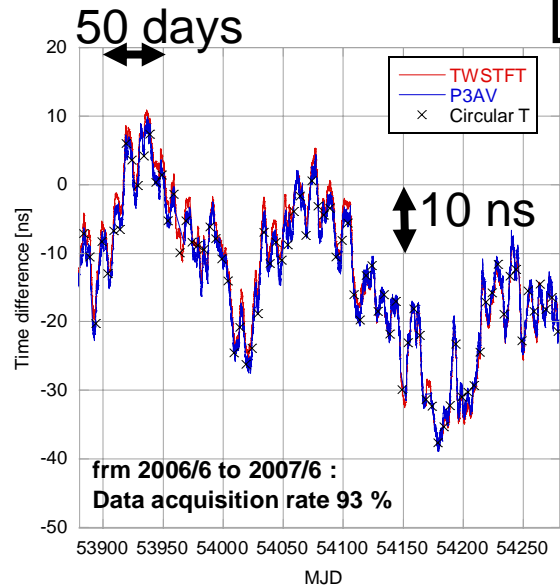
*D. Piester et al., PTTI 2007 * M. Fujieda et al., PTTI 2006

Long term comparison with GPS AV

NICT-AUS: 2007/1 – 2007/6

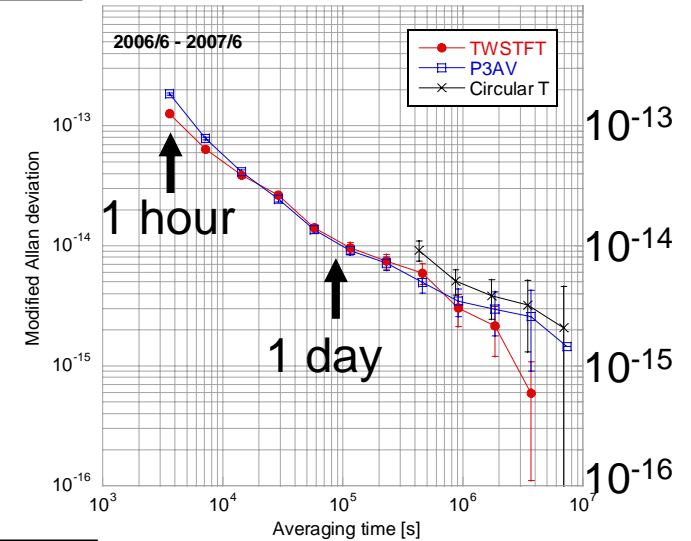
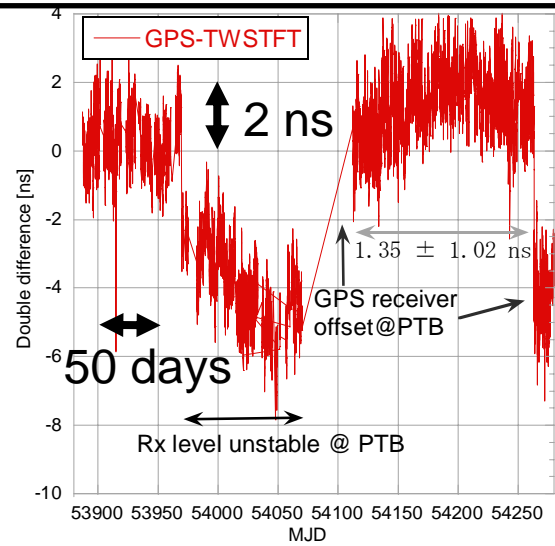
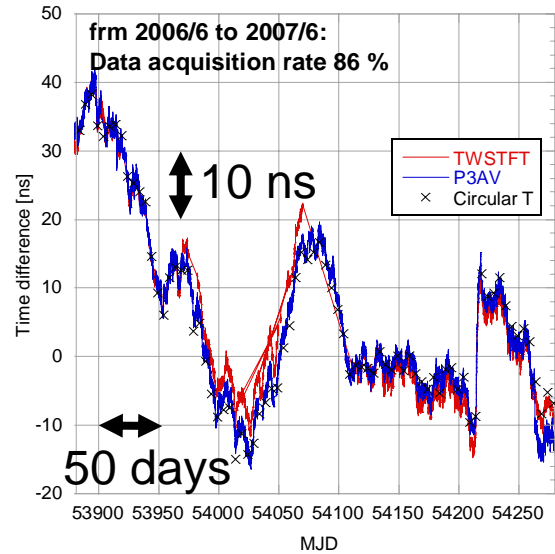


NICT-KRISS: 2006/6 – 2007/6

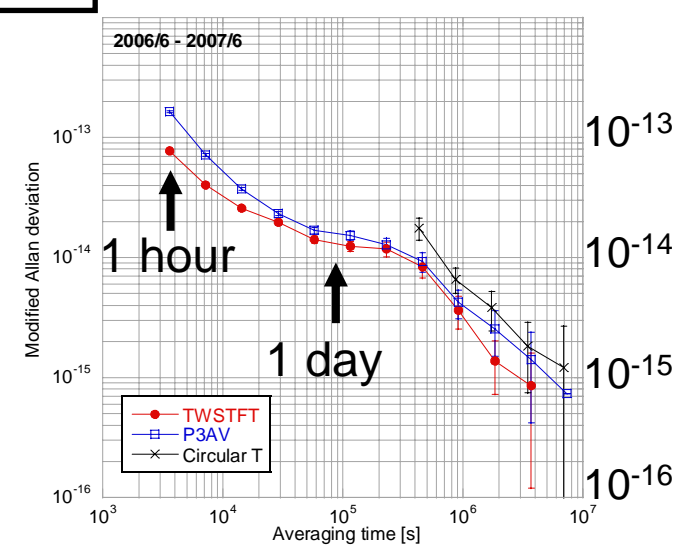
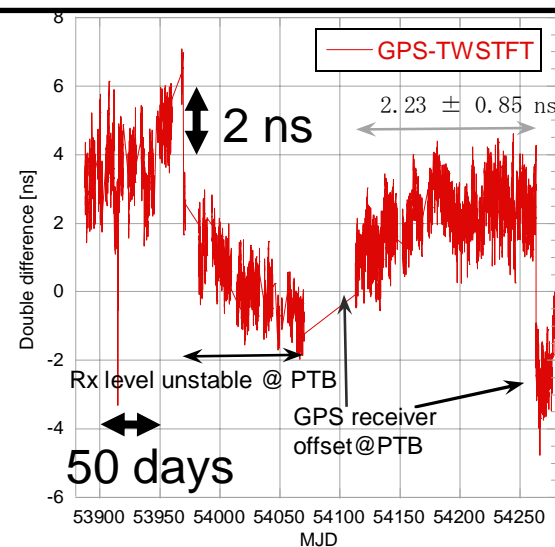
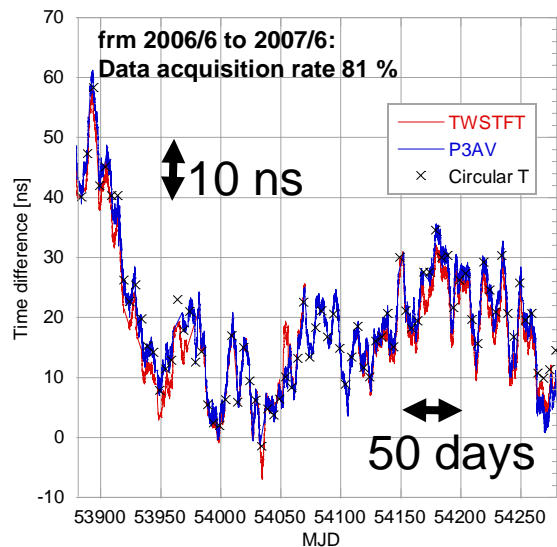


Long term comparison with GPS AV

NICT-PTB: 2006/6 – 2007/6



KRISS-PTB: 2006/6 – 2007/6



Conclusion

- Performances of NICT and SATRE modems were evaluated in comparison to DMTD at zero baseline.
- In long baseline, measurement results by NICT and SATRE modems were compared.
- These results proved that their performances were equivalent and there was no clear difference for mid-term (several days).
- Regarding long-term performance of NICT modem, consistency with GPS AV seems to be enough.
Long-term comparison of NICT and SATRE modems is planned in long baseline.

Thank you for your attention!
