Expected Contributions of the K4 and its Next-generation Systems

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Roadmap of the VLBI Developments in CRL

KSP Backend

KSP Correlator

K3 Correlator (Center)
K3 Recorder (Right)

High Data Rate System (Gbps~)

Real-time System

VSI

K4 (KSP) System

K3 System

High Durability with Cassette Tape Data Recorder
ANSI Standard (ID1) Data Format
Automation/Unattended Observations and Correlation
Data Level Compatibility with Mark-III/IV

Fully Compatible with Mark-III System

Line-up of the Systems under Developments

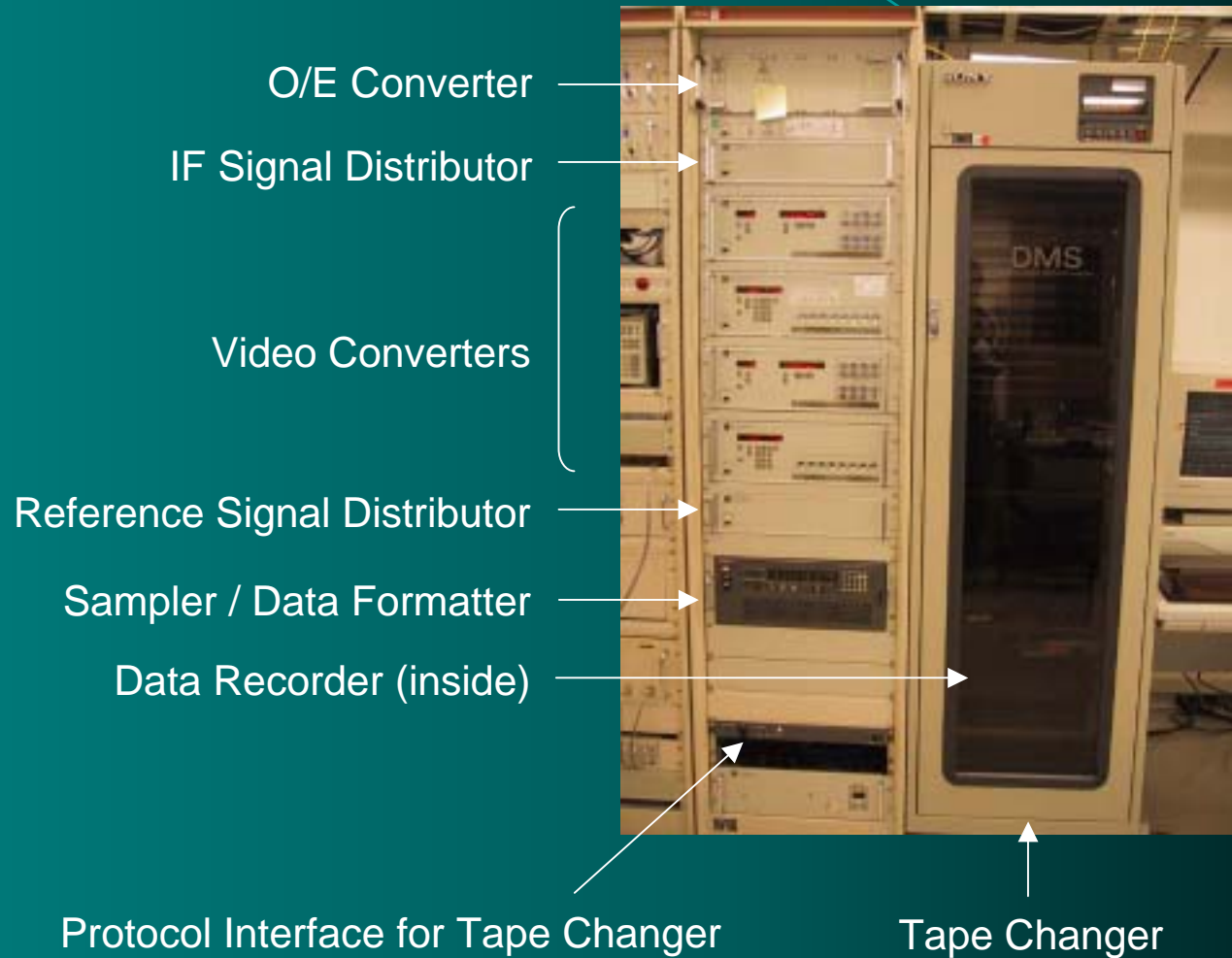|	64Mbps	128Mbps	256Mbps	1024Mbps	2048Mbps	4096Mbps
Tape Based Systems						
K-4 System	●	●	●			
GBR System				●	●	○
Real-time Systems						
ATM	●	●	●	●	○	
IP	●	●	○			

● ••• realized   ○ ••• under developments

K-4 (KSP) system : Capabilities

- 16 channel system with 4/8/16 Mbps/ch.
- High Durability and Reliability
  - endured continuous observations for ~100 days
  - average of successful obs during 5 years ~ 85%
- Automated Observations and Correlation
  - only tape changes required (24 tapes~1 day @256Mbps)
  - no operations required with ATM real-time system
  - automated data analysis

K-4 (KSP) system : Basic Configuration

O/E Converter

IF Signal Distributor

Video Converters

Reference Signal Distributor

Sampler / Data Formatter

Data Recorder (inside)

Protocol Interface for Tape Changer
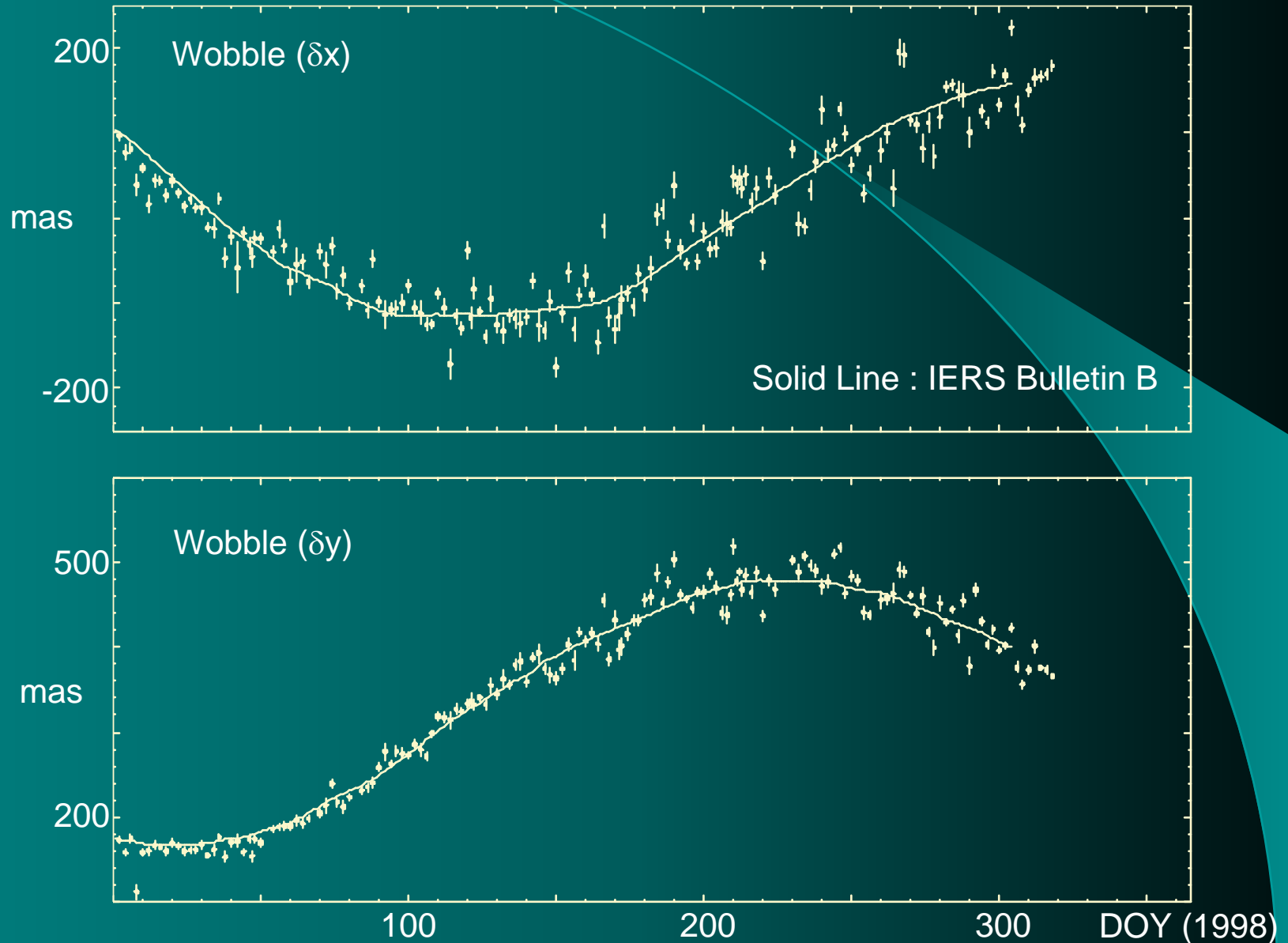
Tape Changer

K-4 (KSP) system : Correlator

- Kashima : 4 stations x 6 baselines
- Koganei : 4 stations x 6 baselines (ATM realtime)
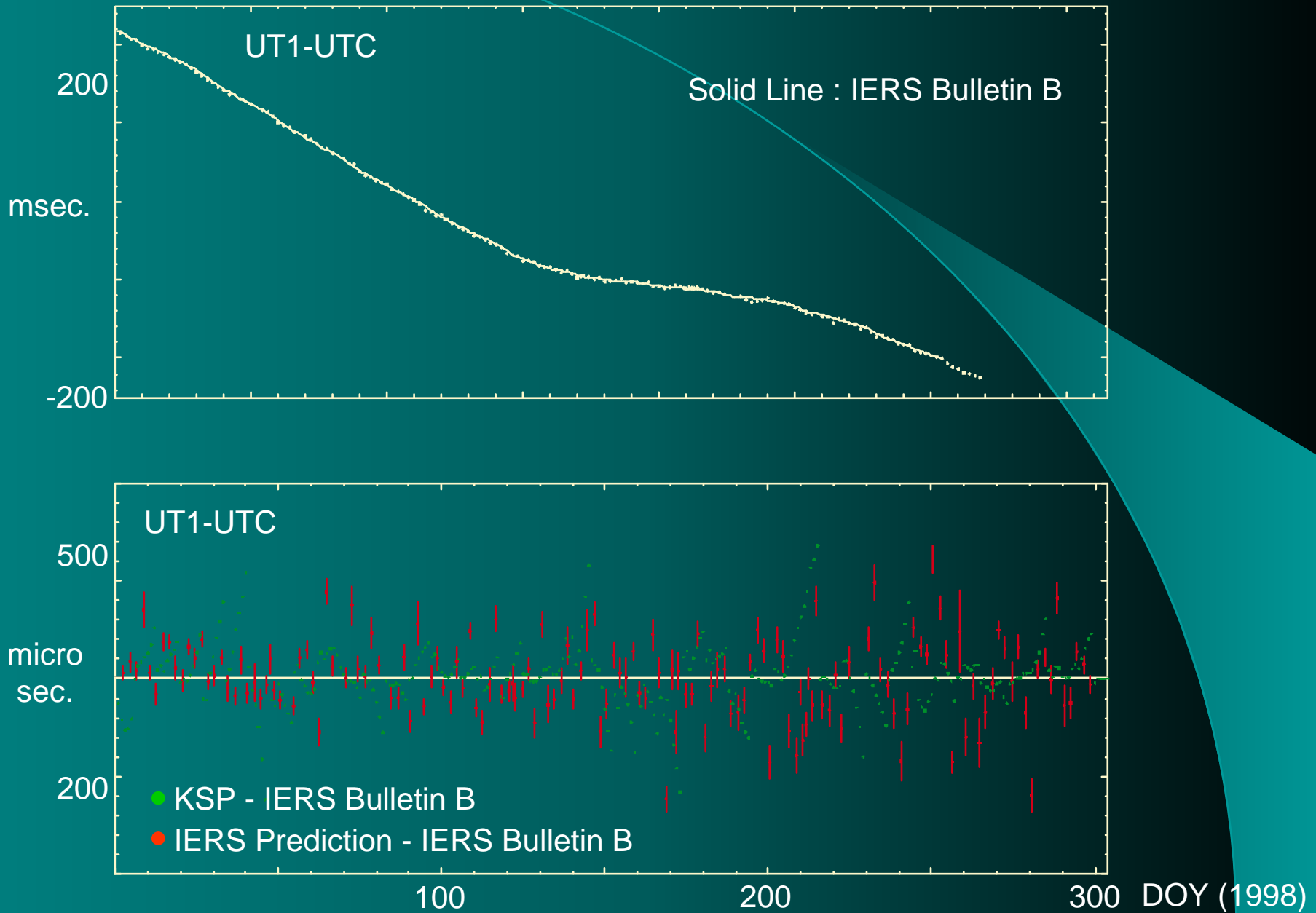- Tsukuba : 3 stations x 3 baselines

KSP Correlator (Kashima)
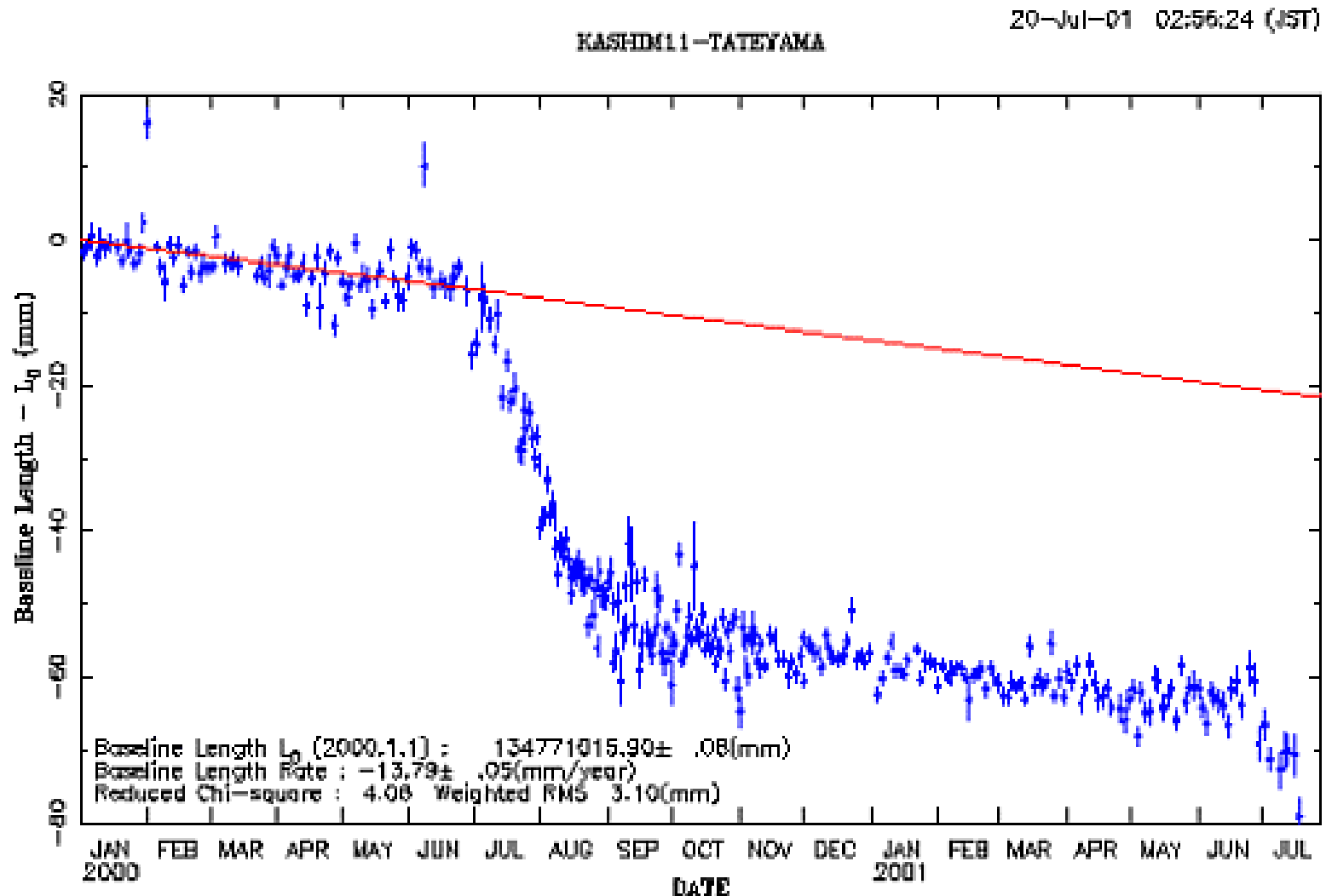
Power of the real-time VLBI : EOP estimation
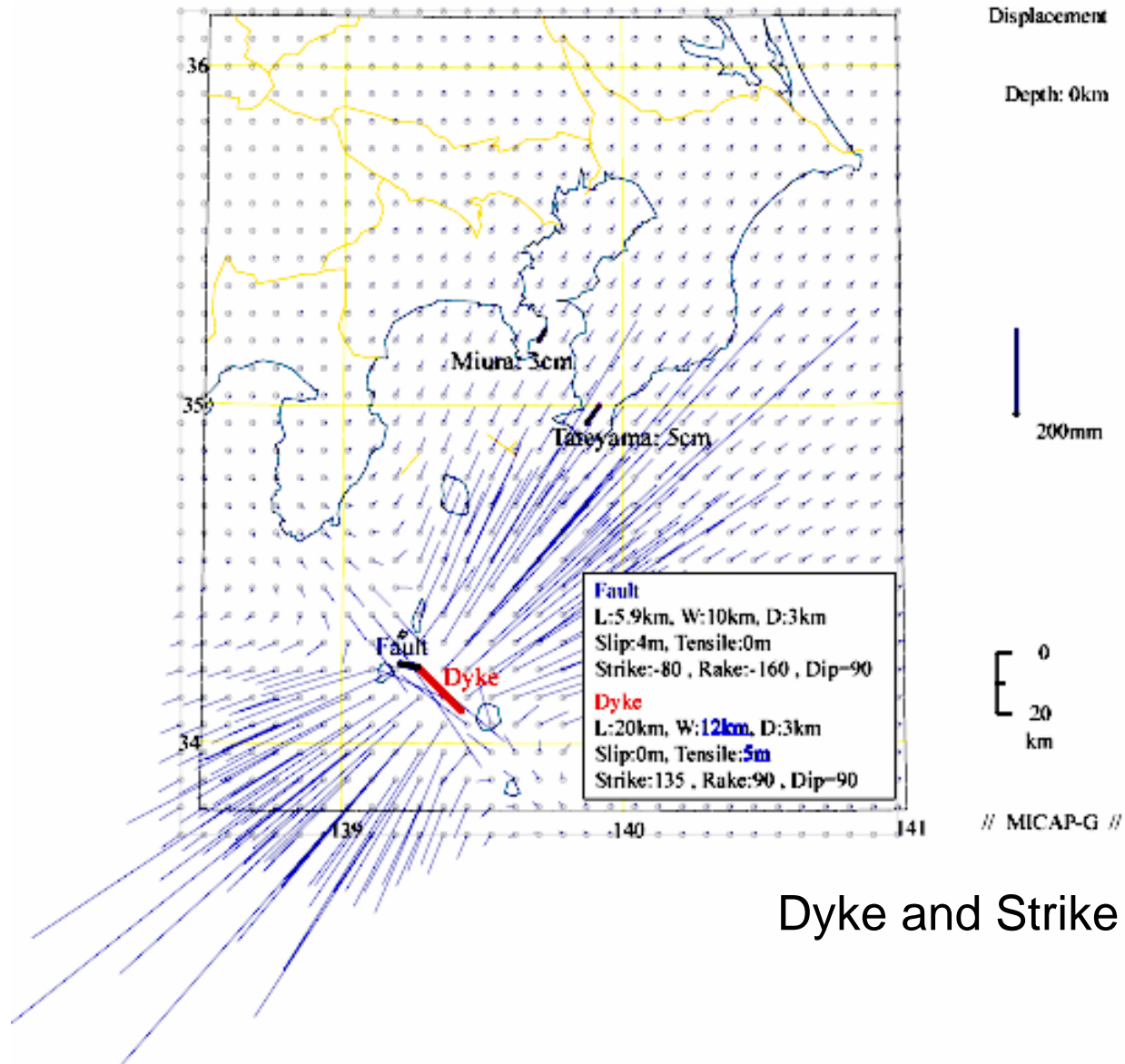
Power of the real-time VLBI : EOP estimation

Power of the real-time VLBI : Site Motion
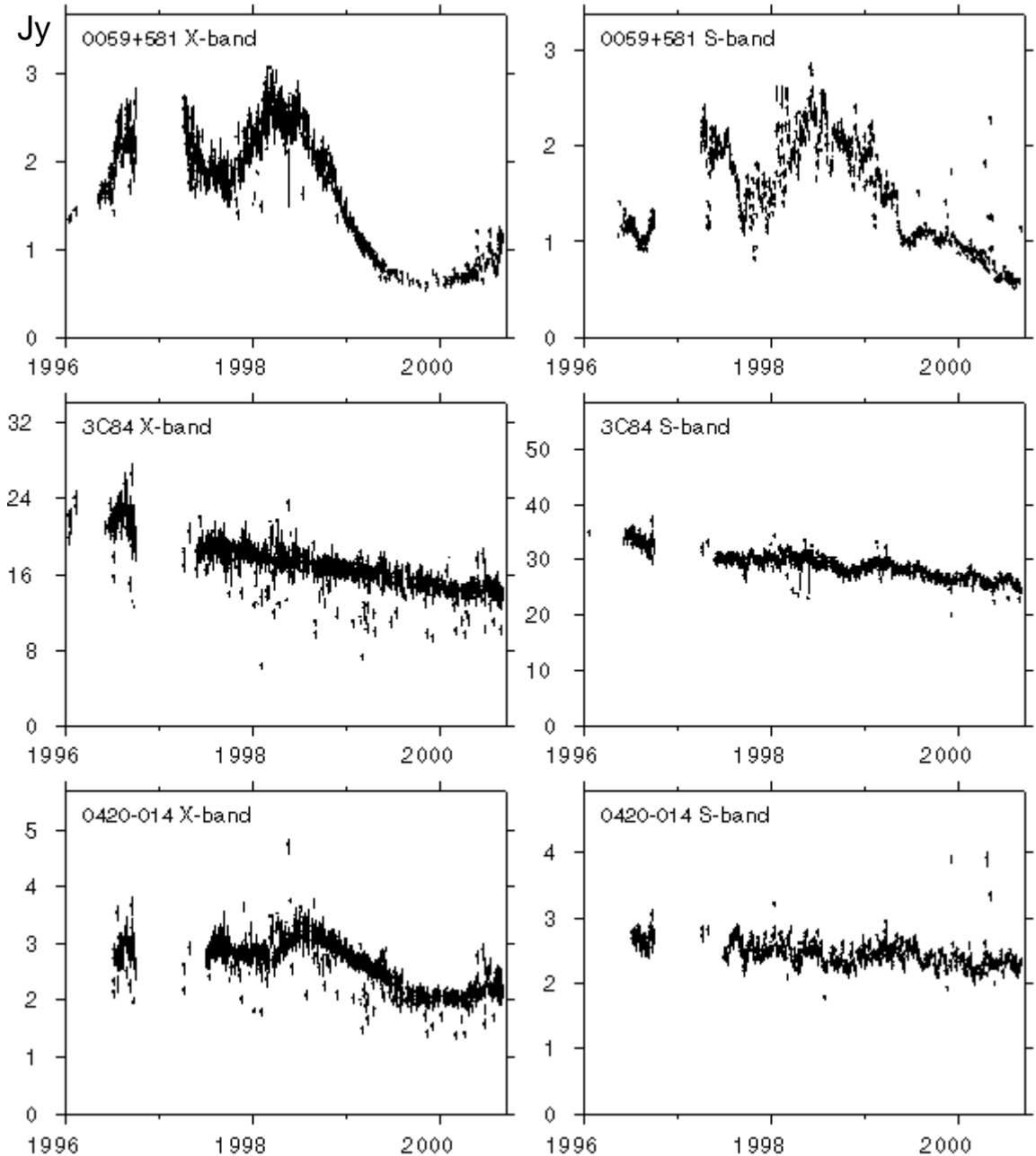
Geophysical Interpretation

Dyke and Strike Slip Model

Power of the real-time VLBI : Flux Monitoring of Radio Sources

Summary

- K4 and its next generation systems will contribute IVS program by
  - reducing operational costs at network stations
  - improving reliability of network stations with quick feedback of problems
  - minimizing time-lag to obtain results after a VLBI session
  - enhancing sensitivity

Future Plans

- Regular international K-4 sessions
  - Expected to start from April 2002 with Tsukuba and Wettzell stations
- real-time VLBI (or e-VLBI) demonstration between Haystack and Kashima
  - Investigations of the feasibility just began
- 2 Gbps ATM real-time VLBI
- PC-based IP VLBI