# GRACE Level-1 Data Processing

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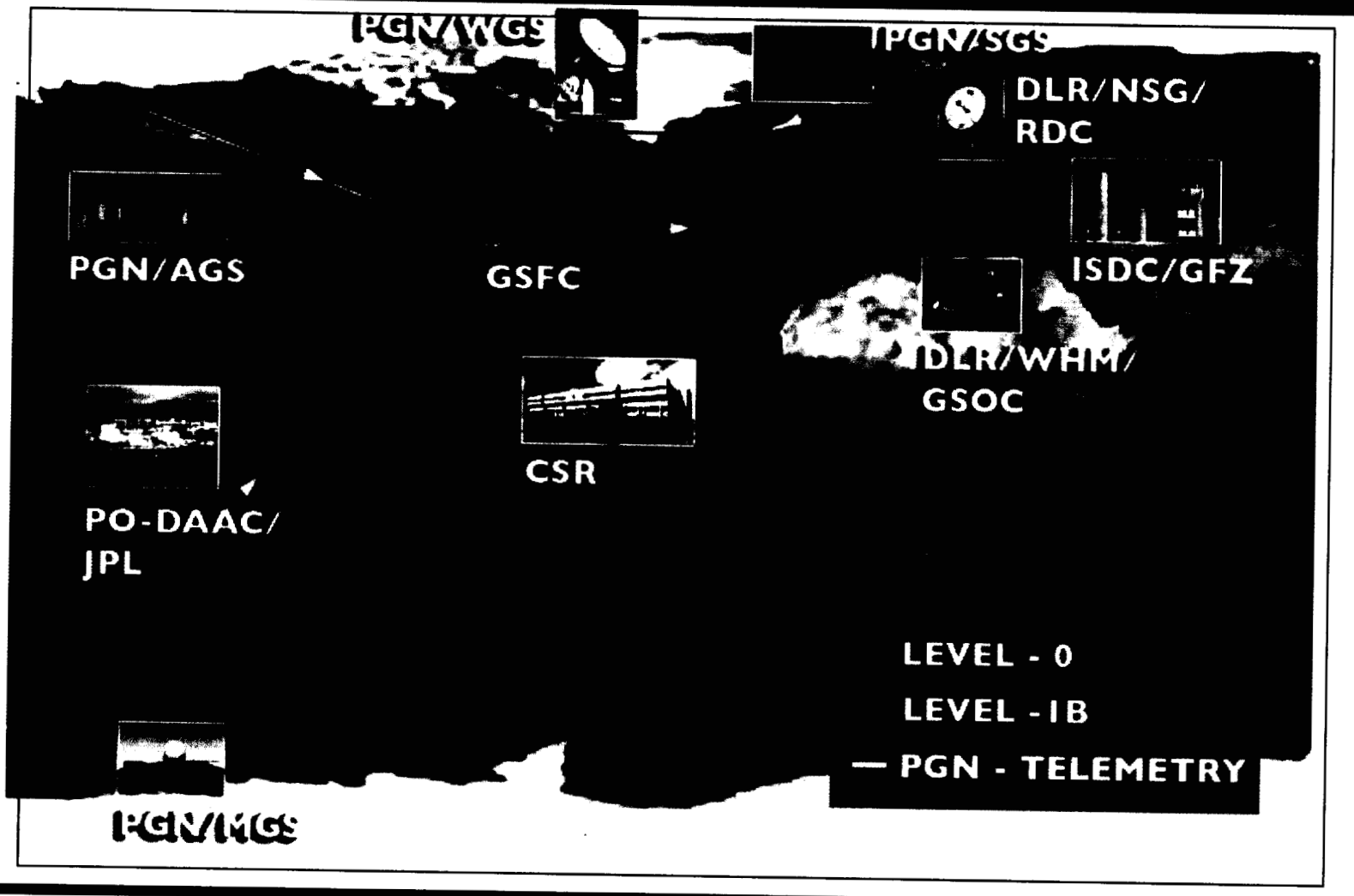
# Overview

- Introduction
- Data flow
- L1 data processing architecture
- Relative time alignment
- Data quality reports + WWW monitoring
- Data highlights for a selected ground track on 3 May 2002
- Data distribution

# Data Flow

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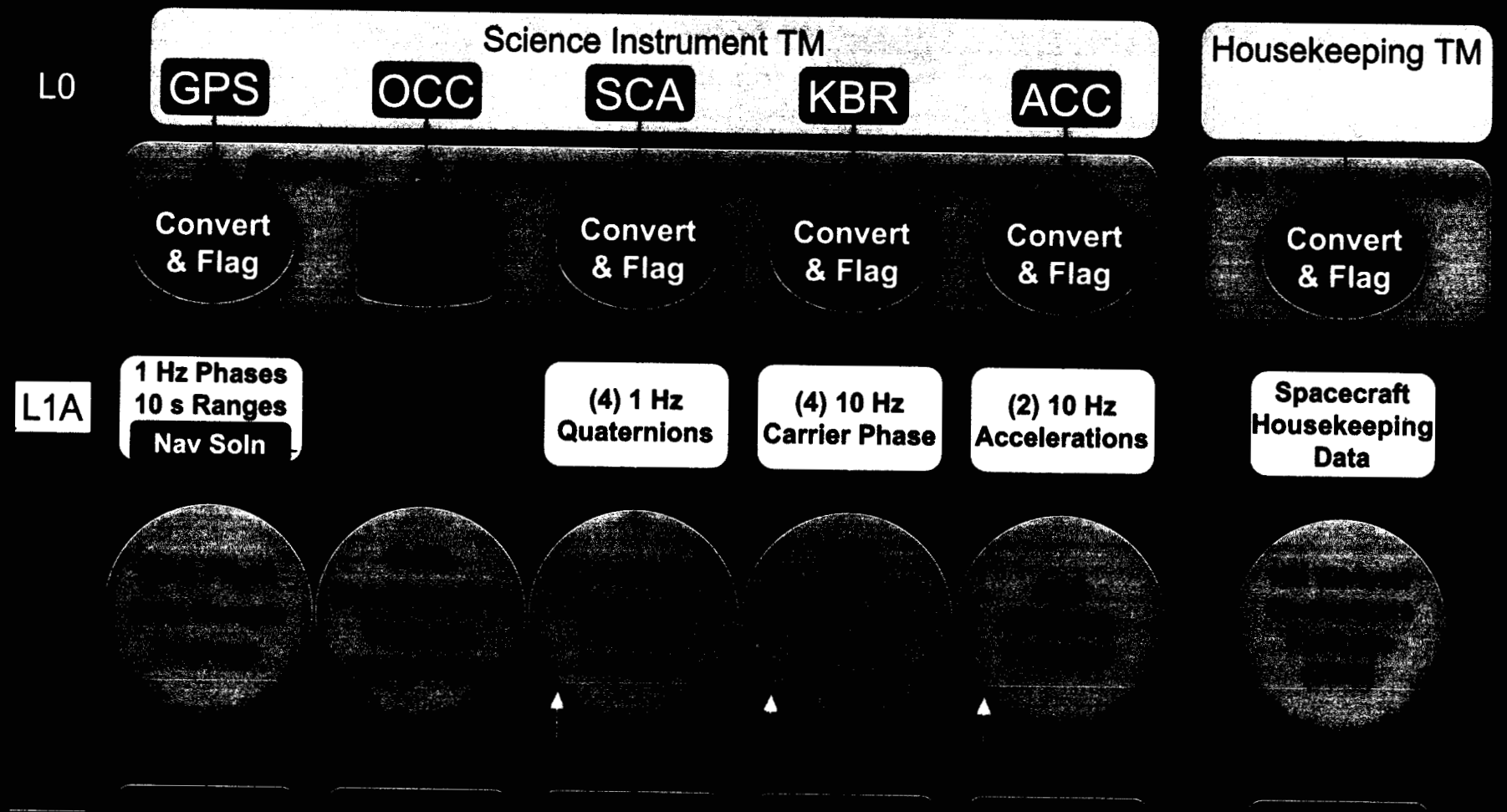
# L1 Processing Software Architecture



# What's dual 1-Way

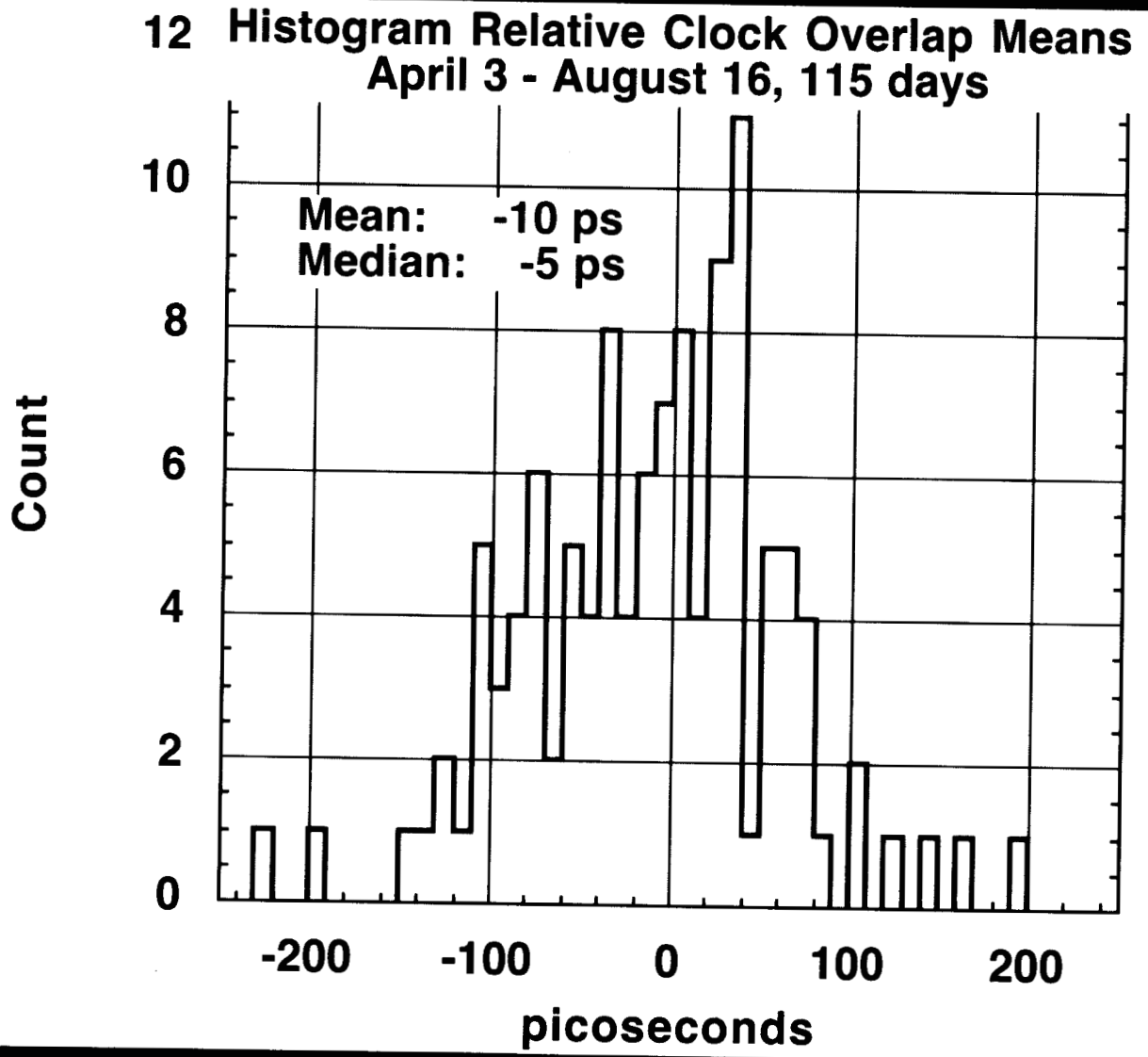
$$\phi_A = C_A(t_r) - C_B(t_t) = R + C_A^e(t_r) - C_B^e(t_t)$$

$$\phi_B = C_B(t_r) - C_A(t_t) = R + C_B^e(t_r) - C_A^e(t_t)$$

$$\phi_A + \phi_B = 2R +$$

$$+$$

# Clock Overlap Tests

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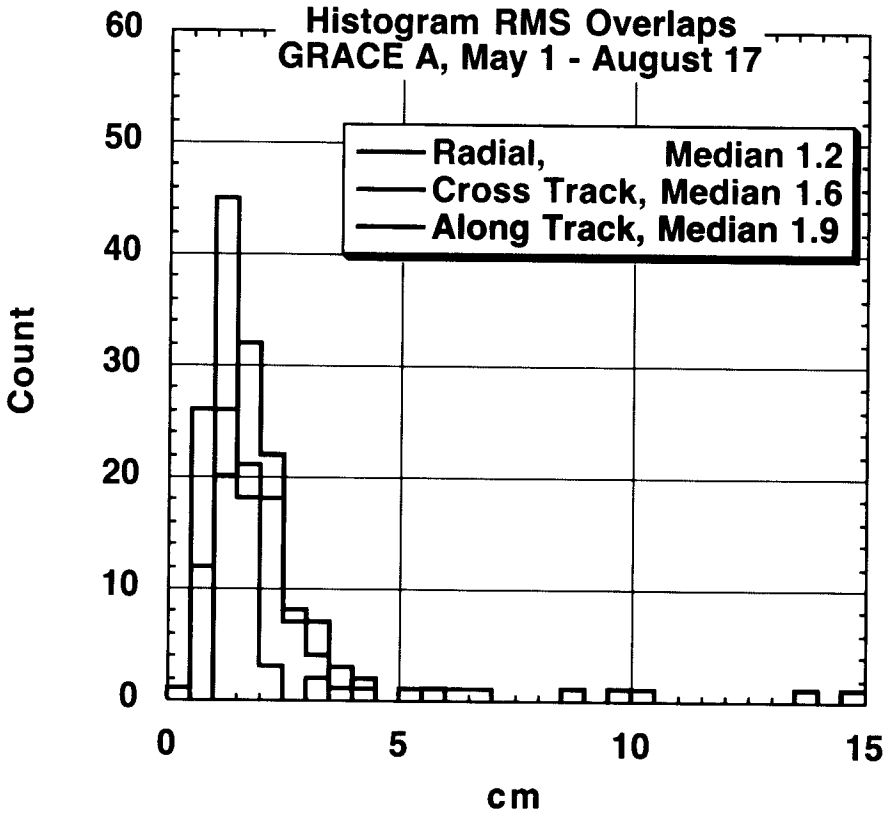
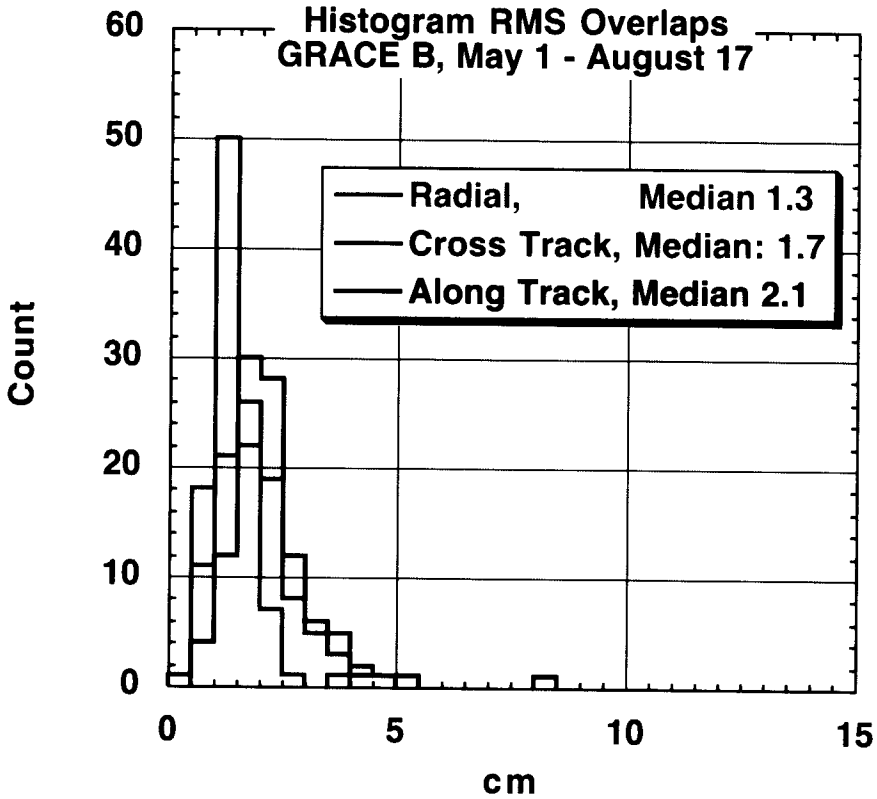
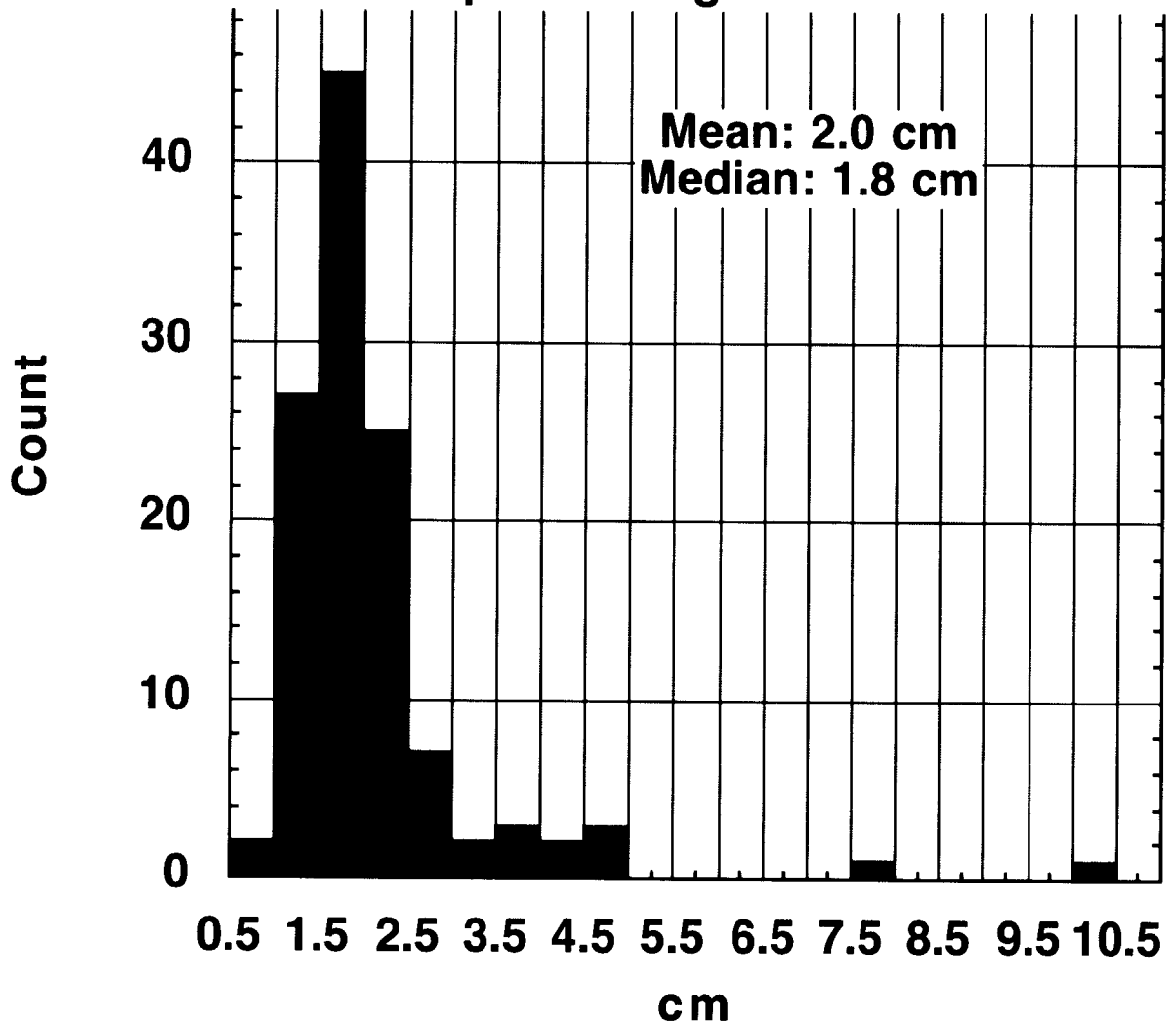
# Orbit Overlap Tests

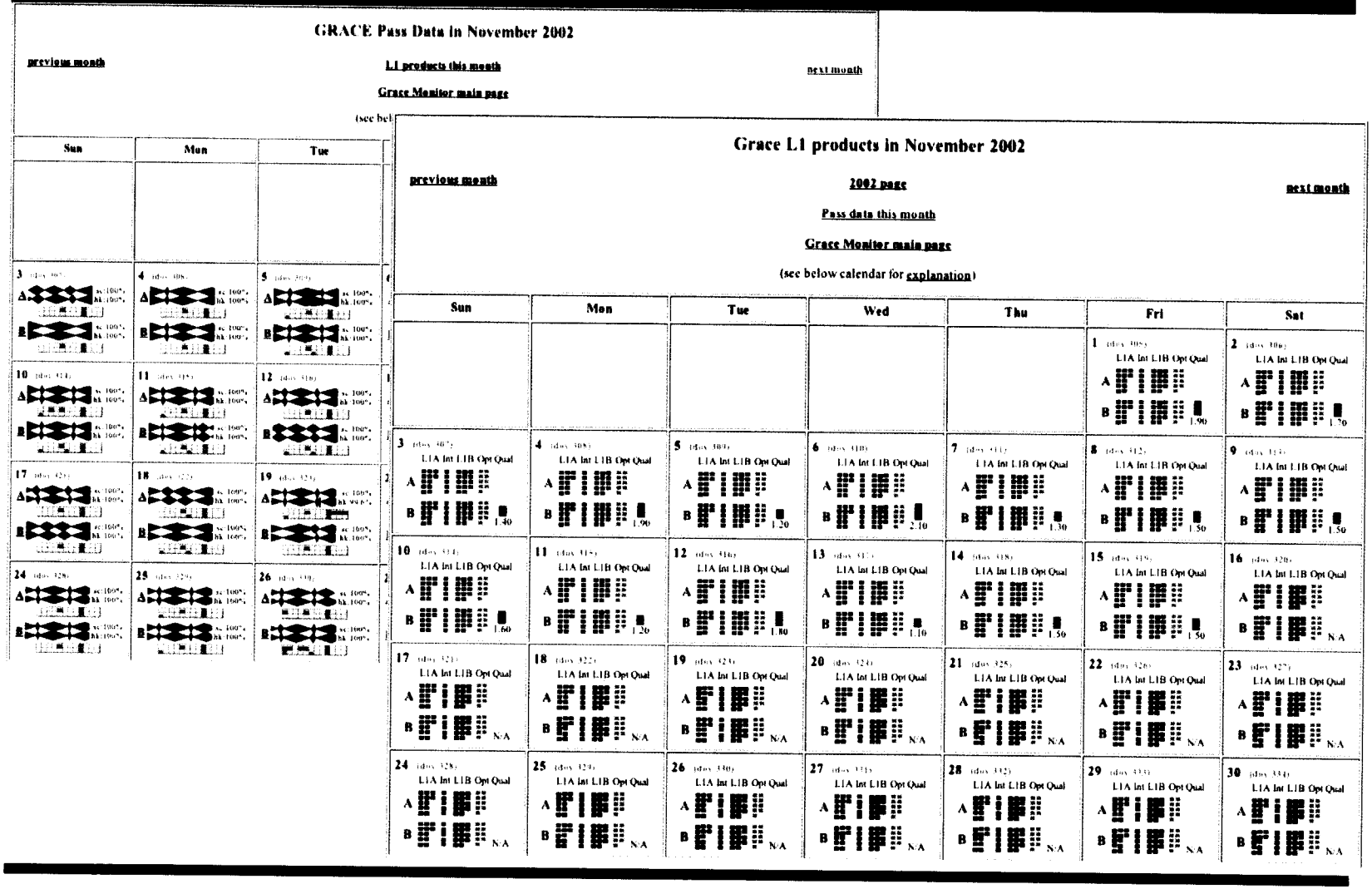


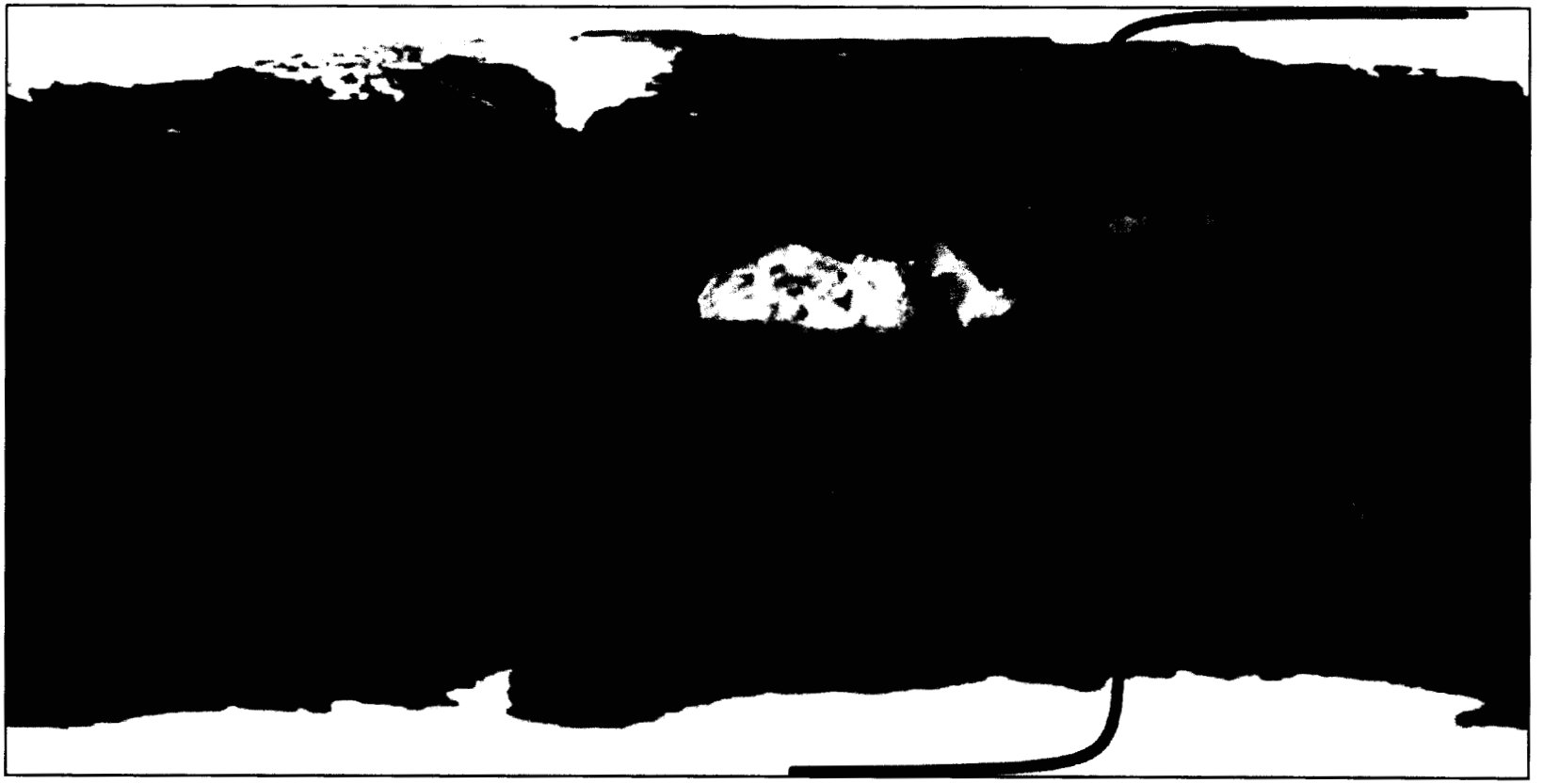
## Histogram RMS Kband Range - GPS Range - Bias
## April 4 – August 16 2002



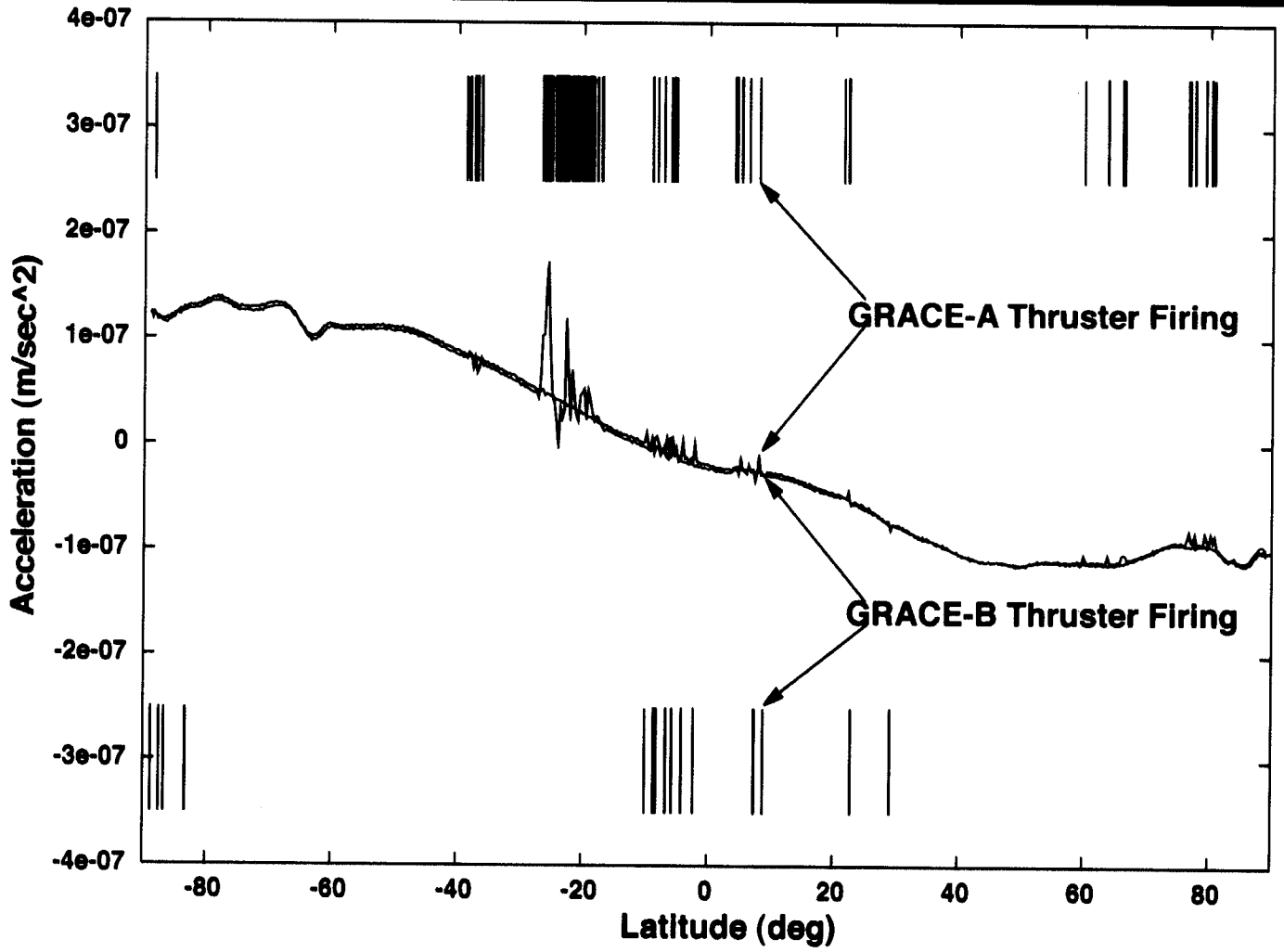
# Data Quality Monitoring using WWW



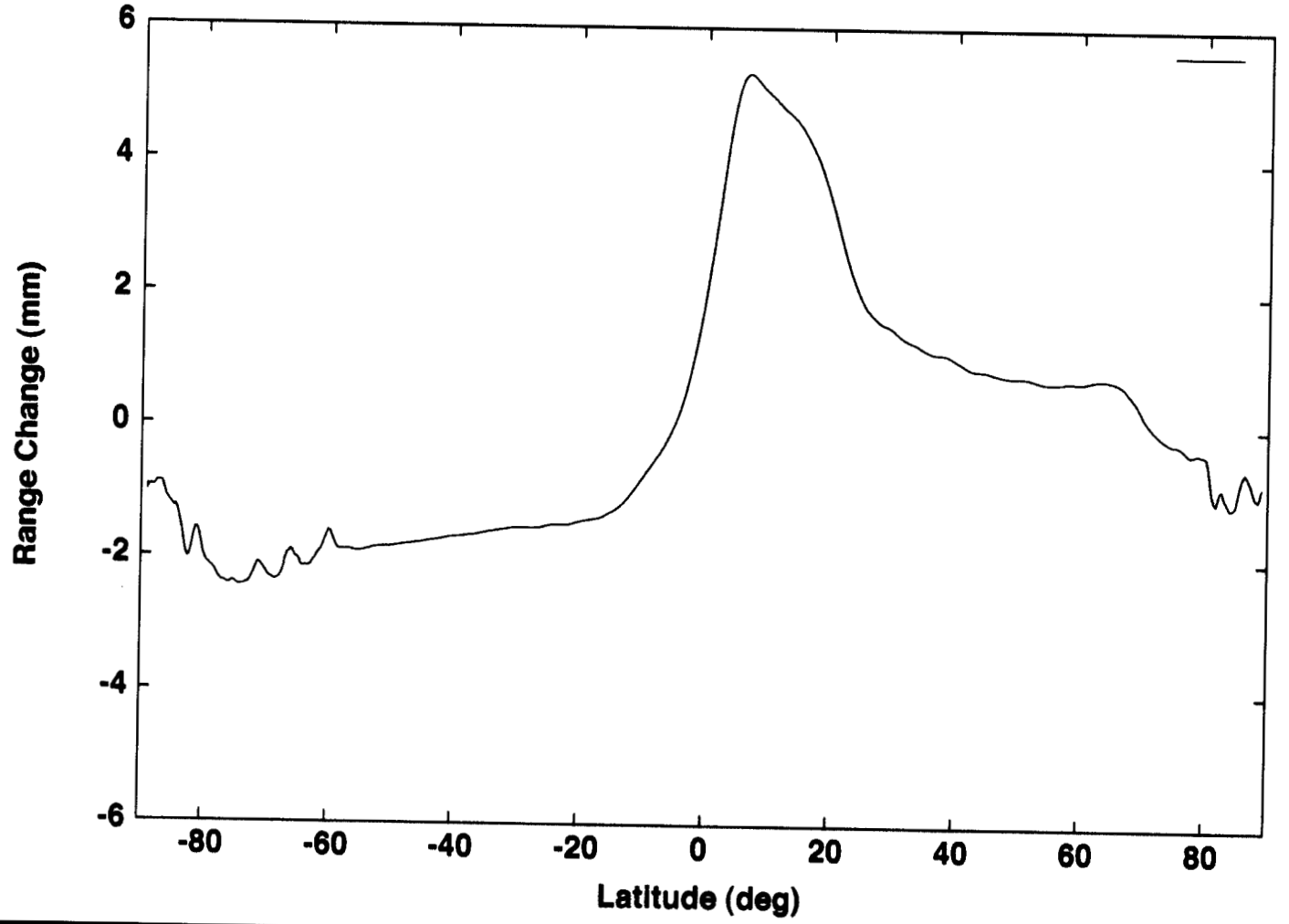
# Sample Ground Track for 3 May 2002



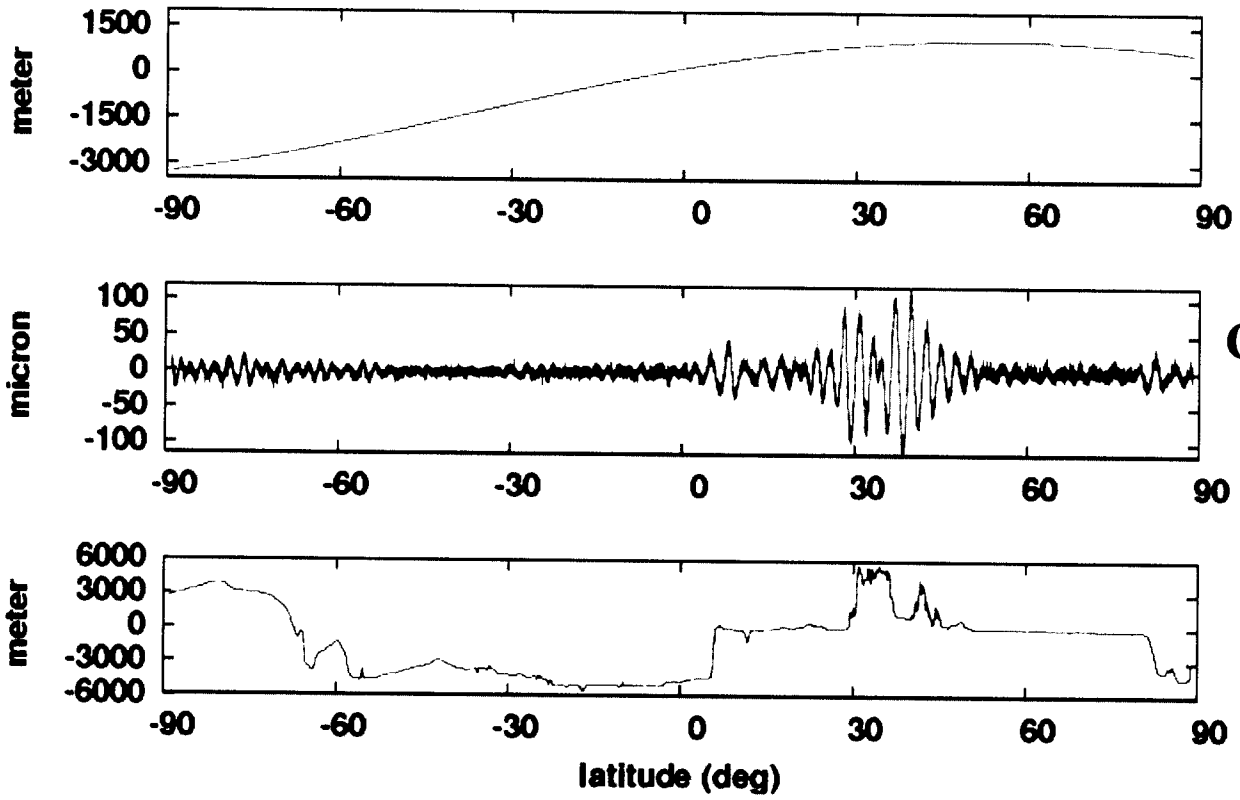
# Relative Along Track Acceleration Comparison (ACC1B + THR1B)



# KBR Range Change Due To Ionospheric TEC Change (KBR1B)



# High Frequency Content of KBR Dual One Way Range Measurement (KBR1B)

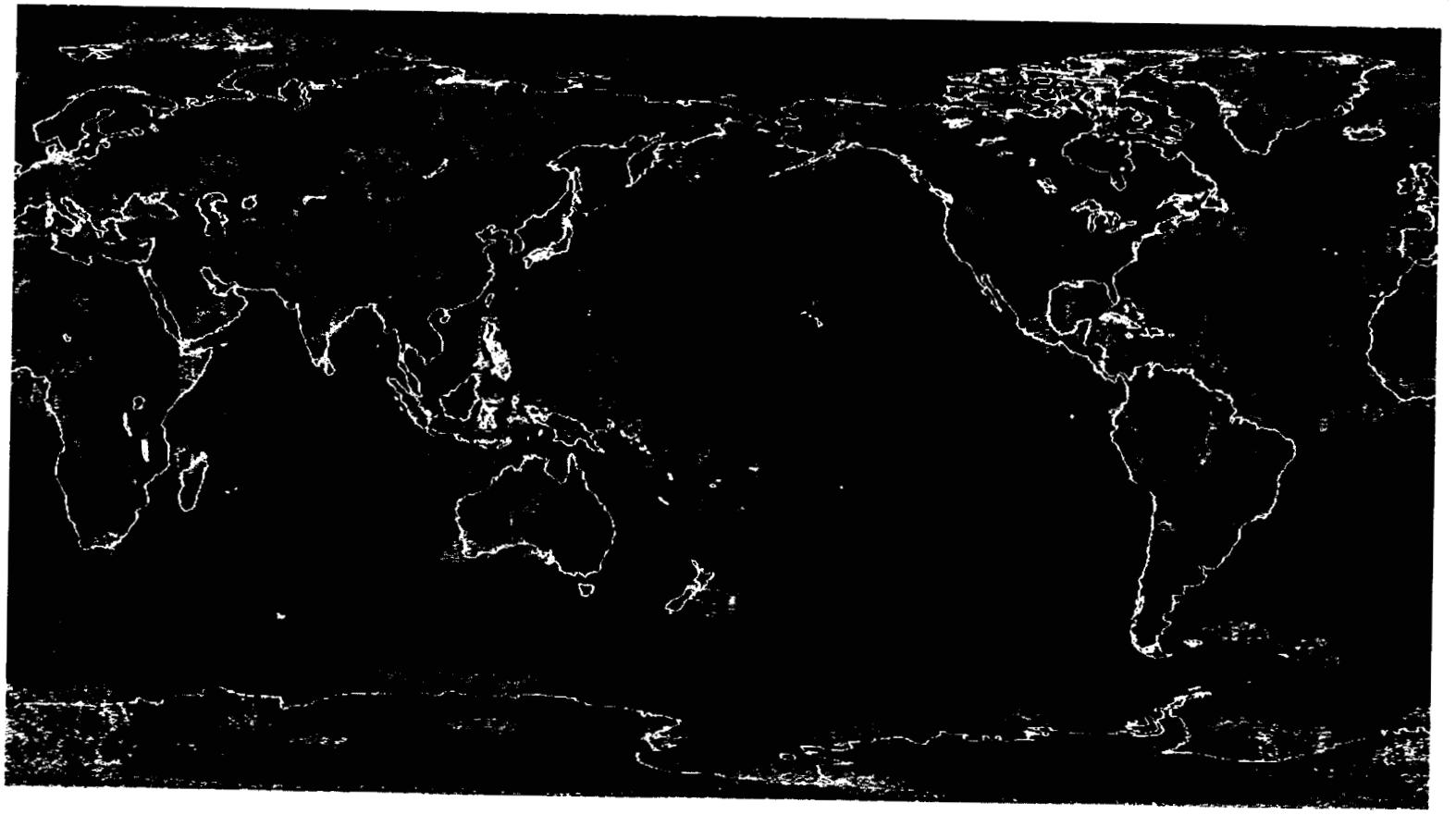



**Full KBR Range - Bias**

**Cubic Spline Residual (30 second knots)**

**Topography Along Groundtrack**

# High Frequency Content of KBR Dual One Way Range Measurement



0 50

**GRACE RANGE, ENVELOPE ( 30sec HI PASS ), MICRONS_(GLK 2002-09-10)**

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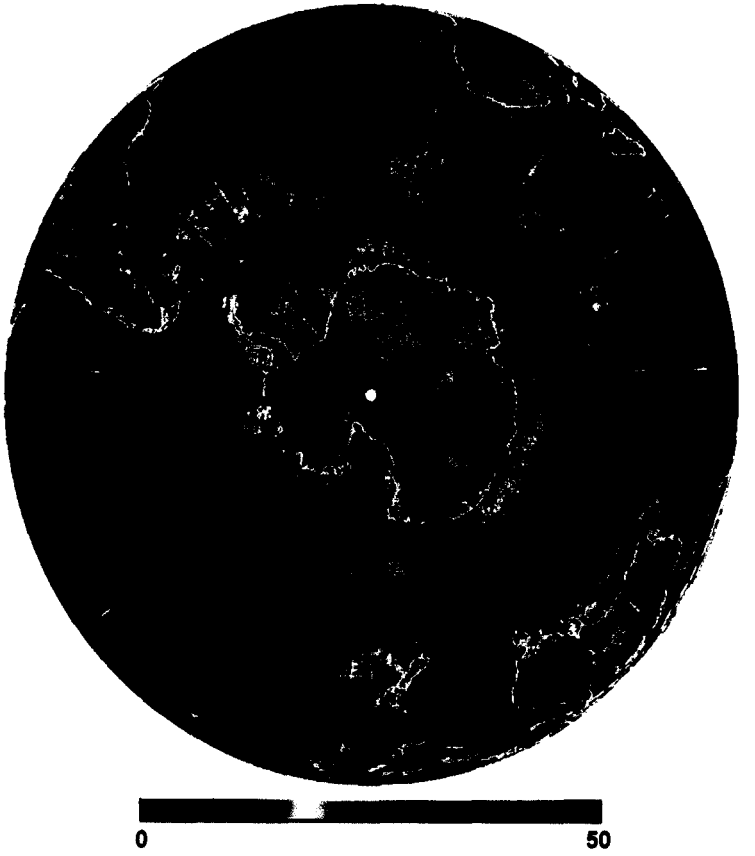
# High Frequency Content of KBR Dual One Way Range Measurement

**North Pole**

GRACE RANGE, ENVELOPE ( 30sec HI PASS ), MICRONS_(GLK 2002-09-10)

**South Pole**




GRACE RANGE, ENVELOPE ( 30sec HI PASS ), MICRONS_(GLK 2002-09-10)

# Data Distribution (1)

- L1B data distribution to general public is projected spring 2003
- L1B distribution consist of daily tar files with following data products:
  - Science: ACC1B,CLK1B,GNV1B,GPS1B,SCA1B,USO1B (for each S/C)
  - Housekeeping: AHK1B,IHK1B,MAG1B,MAS1B,THR1B,TIM1B,TNK1B (for each S/C)
  - KBR1B (Dual One Way Range + derivatives + ionospheric delay change)
  - AOD1B (Atmosphere Ocean De-aliasing produced by GFZ)
  - Vector and Quaternion Products (only released when updated)
  - Report files for each product
  - Total number of files 56+

# Data Distribution (2)

- Draft Data Handbook nearly completed
- L1B data will be available from:
  - PO.DAAC/JPL ftp server
  - ISDC/GFZ distribution similar to CHAMP data
- Data Latency 12 days
- L1A data available upon request