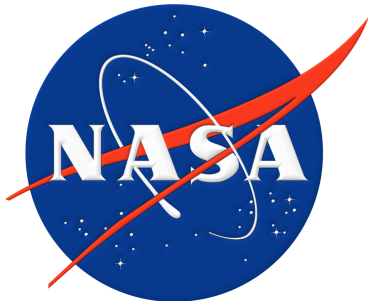

Domestic geodesy support VLBI and SD experiments

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Objective:

- to improve accuracy of geodetic VLBI product
- to assess the budget of instrumental errors

Means:

- specially crafted VLBI experiments that do not contribute to geodesy directly, but support geodetic observations and contribute indirectly
- single-dish (SD) characterization experiments

Goals:

- technical (VLBI)
  - characterization of NASA VLBI antennas
  - simplification of the user interface
  - improving automation

- instrumental (VLBI)
  - investigation of the best setup for optimal performance
  - investigation of instrumental errors
  - investigation of calibration stability

- characterization of the polarimetric purity (VLBI)

- atmosphere characterization (VLBI)
  - collecting statistics of phase fluctuations at a single-baseline KOKEE/east coast experiments

- Tsys monitoring (SDE)

- Gain monitoring (SDE)

Approach:

- Regular schedule for VLBI experiments
  - Weekly **fast lane** 10–60 minute experiments at 2–4 stations
  - Monthly 24 hr experiments at 2–4 stations
  - Two times a month 22 hr experiments at KOKEE/KOKEE12M
- Fast turnaround: L1A data available at 1/2 – 2/3 of experiment cadence: next experiment is scheduled after digesting results of the previous one
- Semi-annual reports and setting goals for the next semester
- Floating schedule for performance monitoring experiments

Issues/Concerns/Risks:

- Station operational readiness
- Fast turnaround is challenging
- “Boring”

Resource requirements:

- 300–500 hours per year for VLBI for observations and correlation
- 200–2000 hours for SDE
- 0.2–0.5 FTE for scheduling, analysis, and report preparation

Roles and responsibilities:

- A scientist and a technologist define the program, generate a schedule, process the data, and prepare a report;
- Station personnel runs the schedule, submits FS logs, transfers Level 0 data to a correlator
- Correlator runs DiFX and submits Level 1A results;
- A scientist and technologist analyze experiment, review results, and provide a feedback to scheduling the next experiment;
- A programmer supports data analysis when needed.

Timeframe/Schedule

- We can start any time
- Observing program will be re-evaluated twice a year
- Runs indefinitely, but it is expected the scope of a VLBI part of the program will be reduced within 1–2 years.