IVS VLBI2010 Workshop on

Future Radio Frequencies and Feeds (FRFF)

March 18 – 21, 2009

Wettzell, Germany

Working Group 3 of the International VLBI Service for Geodesy and Astrometry (IVS) formulated a vision for the next-generation VLBI system, dubbed VLBI2010, which aims at an improved service for geodesy and astrometry, among other things. The VLBI2010 vision touches all VLBI elements and components, from observation, to correlation, to analysis.

Geodetic VLBI observations are currently carried out primarily on S- and X-bands (2.2-2.4 and 8.2-9.0 GHz). A major innovation of the VLBI2010 system is the use of broadband feeds (1 or 2 to 18 GHz and perhaps up to 32 GHz) to address issues related to delay precision, source structure, and RFI.

The goal of the FRFF Workshop is to develop recommendations to the IVS Directing Board on the definition of the VLBI2010 radio frequencies and the specifications for VLBI2010 feeds. Fixing these parameters is important for future VLBI2010 developments and the realization of VLBI2010 antennas such as the German Twin Telescope Wettzell (TTW). Toward that end, talks and discussions will address possible options for observation frequency ranges that will allow VLBI2010 systems to achieve the VLBI2010 goal of 1-mm position accuracy in 24 hours, within the real-world constraints imposed by RFI, feed and antenna design, broadband receiver technology, calibration, and other factors.

The FRFF Workshop is mostly geared toward VLBI experts and electronics/RF engineers, who are encouraged to contribute with their expertise to the definition of the VLBI2010 radio frequencies. The workshop will be divided into a tutorial part and a part with open contributions.

We foresee having presentations and discussions on the following subjects:

- broadband observation
  - how does it work
  - what are the potential pitfalls
  - alternatives
- feed issues
  - multiple feeds vs. a single broadband feed
  - measuring feed performance
  - recent broadband feed developments
- polarization
  - circular polarization vs. linear polarization
  - implications of polarization choice for backend & correlator design
- broadband receiver design
  - broadband amplifiers
  - receiver architecture
  - calibration
- radio frequency interference (RFI)
  - radio frequency spectrum: commercial vs. scientific usage

    - mitigation of RFI vs. avoidance of RFI
- geodetic ties between VLBI and other techniques (GNSS, SLR, etc.)
    - L-band observations of GNSS satellites for orbit determination
    - L-band observations of GNSS satellites for site ties
    - intra-site connected-element interferometry
- conclusions and recommendations to the IVS Directing Board
    - future VLBI2010 radio frequencies
    - future VLBI2010 feed specifications

In conjunction with this 3-day workshop a one-day IVS VLBI2010 Committee (V2C) meeting will also be held. The theme for the V2C meeting will be VLBI2010 digital processing, i.e., requirements and implementation issues for the VLBI2010 DBE/DBBC and correlator.

In order to make arrangements for the meeting room and accommodation in the Wettzell area, the Local Organizing Committee requests that interested people send a note on their intent to participate to frff@fs.wettzell.de by October 31, 2008. The Second Circular will contain the tutorial program and detailed logistical information for the participants.

Deadlines:

2008-10-10	First Circular
2008-10-31	RSVP (*répondez s'il vous plaît)* on intent of participation
2008-11-12	Second Circular (with tutorial program, call for contributed presentations, and details on accommodation and meeting place)
2009-01-15	Submission of abstracts for contributed presentations
2009-01-31	Third Circular (with full program)