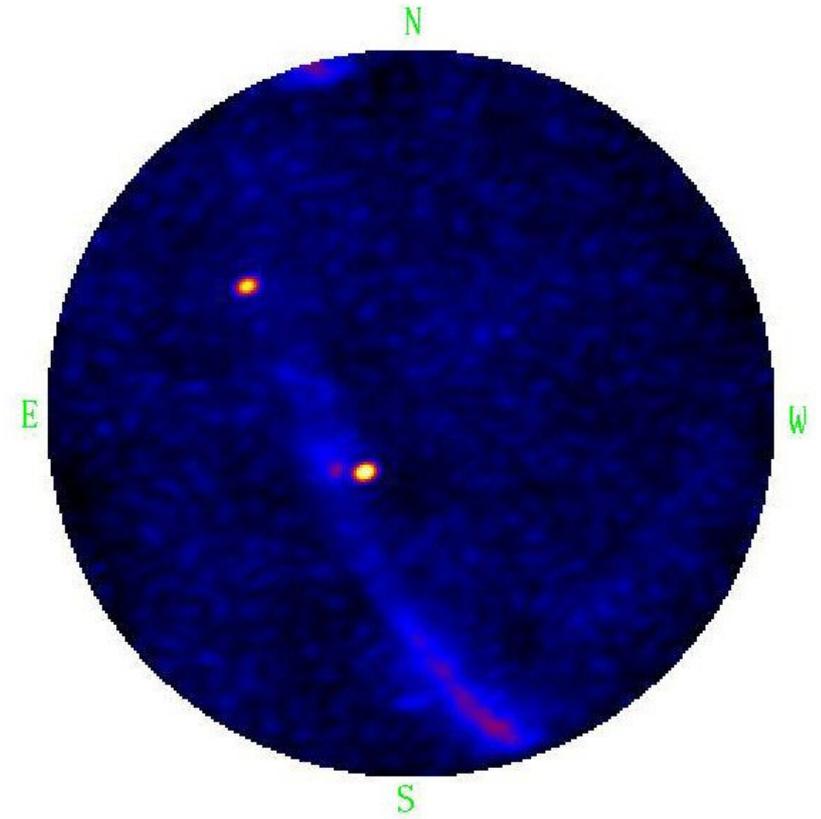


Effelsberg Status

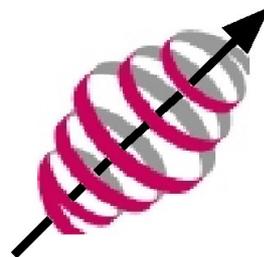
James M Anderson

anderson@mpifr-bonn.mpg.de

On behalf of MPIfR and the LOFAR collaboration



Max-Planck-Institut
für Radioastronomie



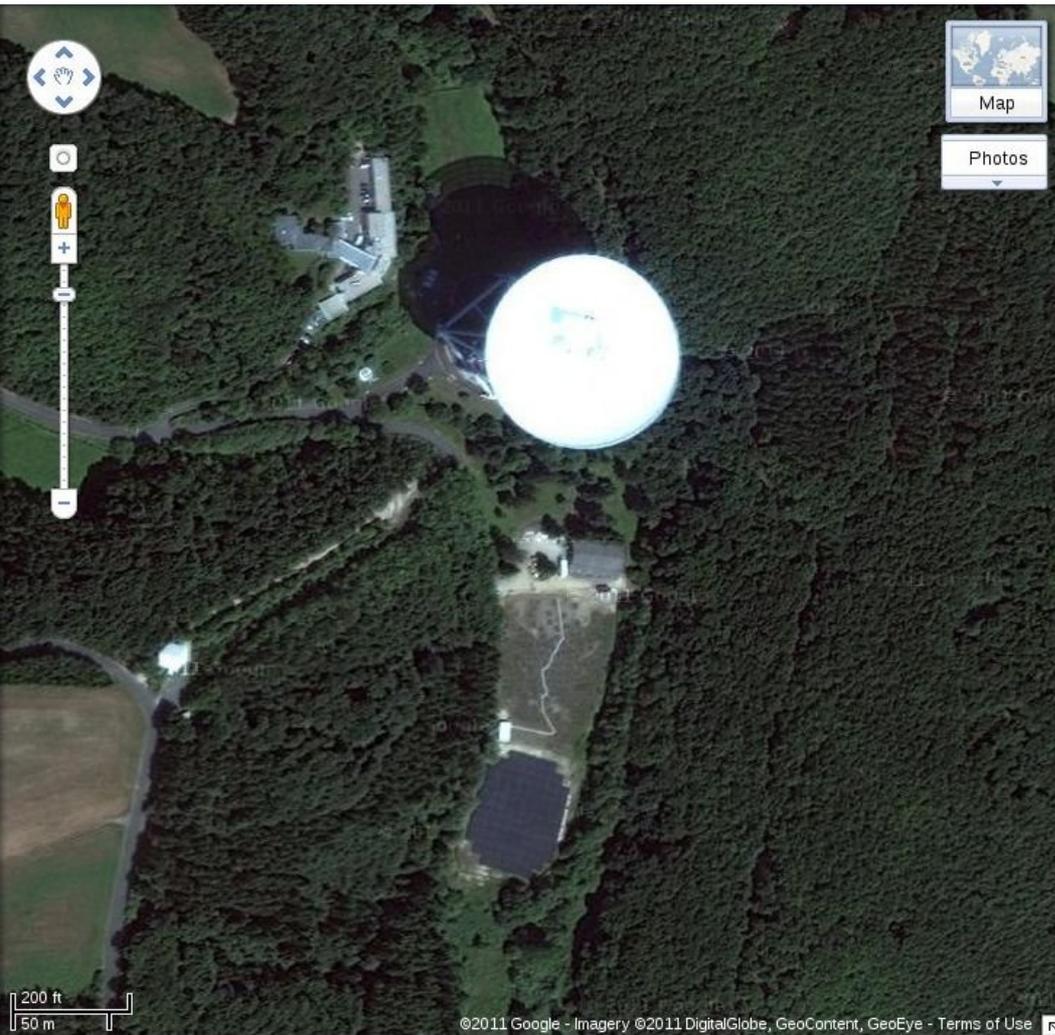
LOFAR



MAX-PLANCK-GESELLSCHAFT



Overview of EF



Recent/Current Issues



HBA Field Repair 2012 Apr 03



A Horneffer

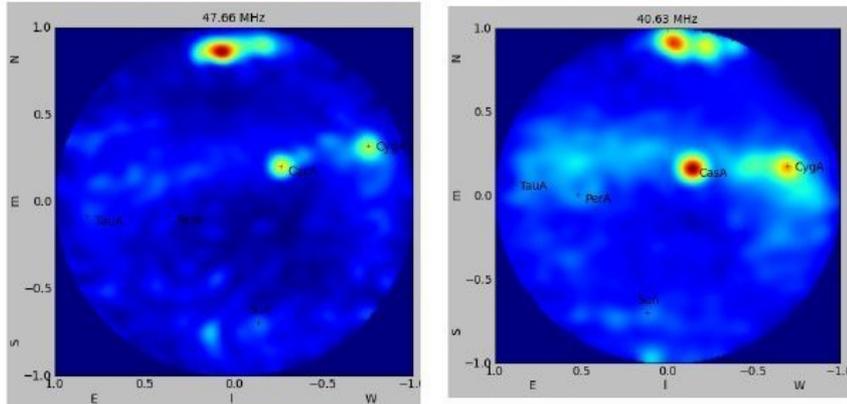
- 3 rubber tie-down straps broken
- 2 nylon anchor cords broken
- Significant amounts of styrofoam pellets between tiles (no sign of rodents)



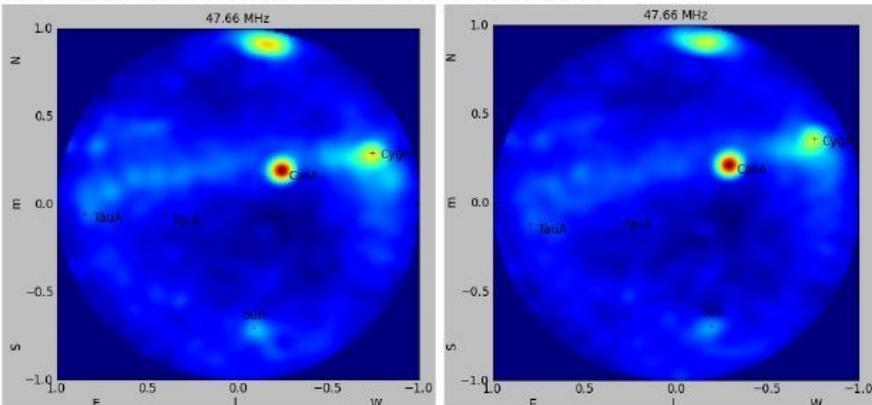
JM Anderson

RFI Problems

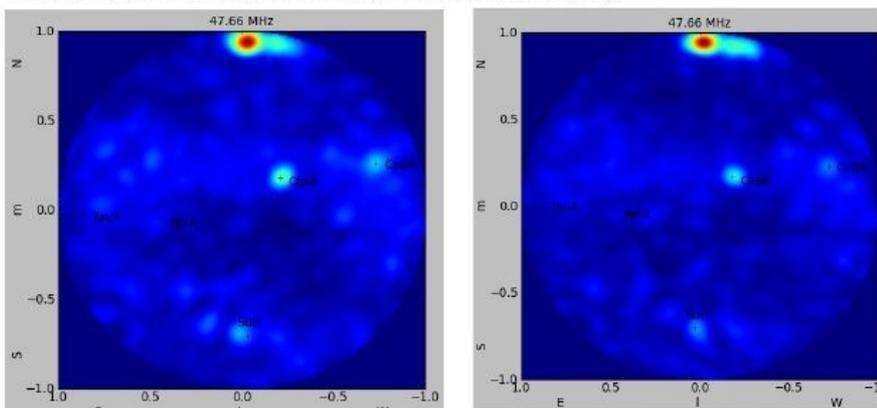
Teleskop im Stillstand für versch. Freq.. Links zeigte das Teleskop nach Süden, rechts nach Norden:



Teleskop zeigt nach Süden, links Azimut-, recht Elevationsbewegung:



Teleskop zeigt nach Norden, links Azimut-, rechts Elevationsbewegung:



- RFI is preventing ASTRON software from producing RCU calibration tables for Effelsberg
- RFI source nearly certainly the 100 m
- Tests on Apr 03rd strange
 - RFI stronger when 100 m drive motors turned off
 - But as expected, RFI lower when 100 m pointed South (blockage by dish)
- Tests will continue

Images by J Köhler

LBA Growth



- Hand in photos to get camera to focus properly, not intended for scale demonstration

Additional Hardware at EF

Antenna Wind Protection



- Cement blocks added to LBA filed in 2008 to help prevent wind damage
- Wooden posts installed at HBA field in 2010 to prevent tiles from moving
 - Only edge tiles were observed to move significantly in strong wind



Electronics Container Changes



- Added an insulating roof
 - Reduce air conditioning bill in summer when Solar heating important
 - Hopefully also reduce heating bill in winter when station not in use
- Added automatic humidifier
 - Extreme low humidity conditions encountered during winters, with many electronic component failures
 - Dug a well for water, automatic filling of basin in container



Recording Equipment

In EF Faraday room



lofar1b

- 10 GE interface
- > 600 MB/s RAID write speed to record full station beamformed datastream

lofar1a, lofar2a, lofar3a, lofar4a

- 4 separate machines with 1 GE interfaces
- Oxford type computer for pulsar observations
- Does not seem capable of raw data recording for full bandwidth

lofar4

lofar3

lofar2

lofar1

- Original EF recording computers (2007)
- 1 GE interface, 8x2 TB RAID each
- Used for raw beamformed/TBB data recording

lofarsrv

- 40 TB storage server, 10 GE interface
- Transfer from ILT archive, raw data



VLBI Cluster (Bonn)



- 10 GE link from EF
- 60 node x 8 core Linux PC cluster
 - Cluster primarily used for VLBI correlation and pulsar computing, but time available for LOFAR
- 200 TB spinning disk storage for LOFAR
- Expected to be upgraded in 2013

Old MkIV correlator at Bonn (2008, MPIfR)
I could not find a photo of the current cluster

Ongoing Single Station Developments

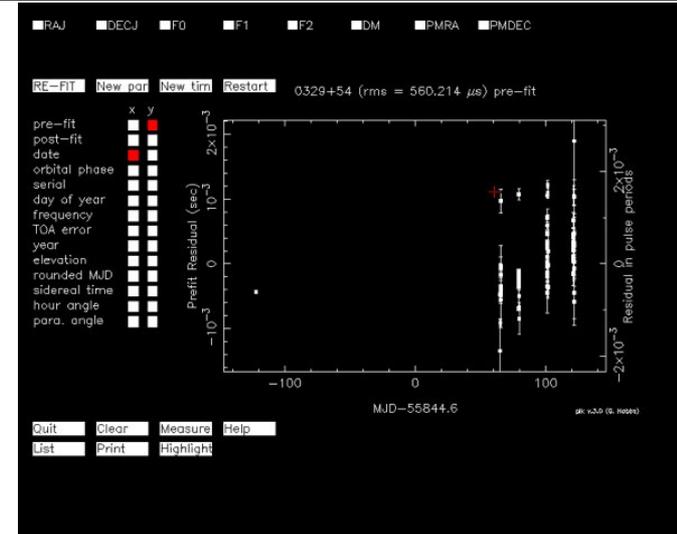
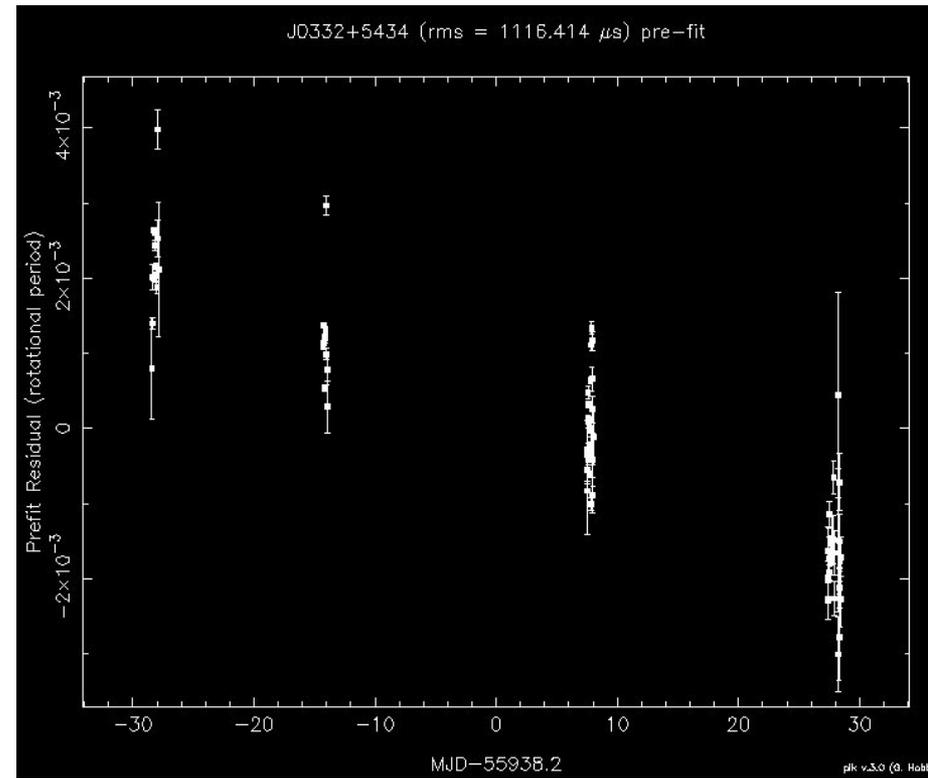
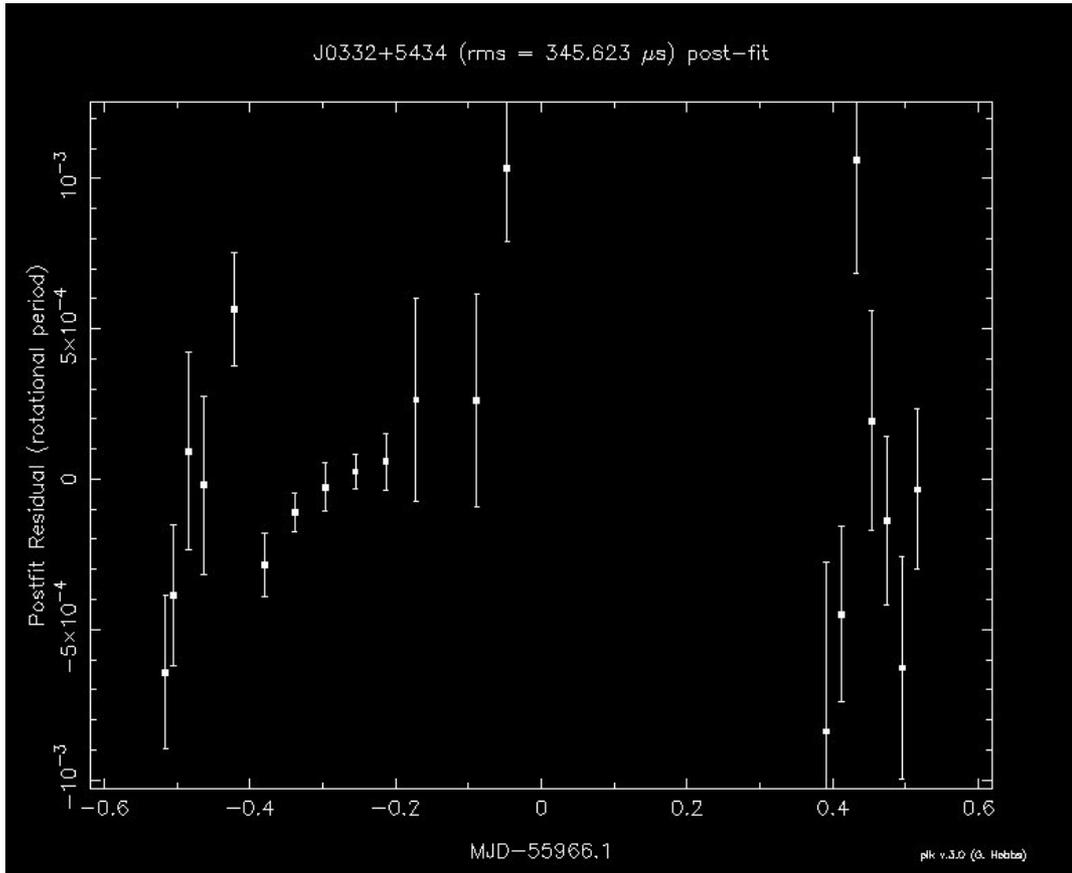


Development Areas

- **Pulsar science (Transients KSP)** To be discussed at the Single Station Users Meeting in Nançay
 - Timing (LuMP, Kuniyoshi, dspsr software development)
 - Polarization (LuMP, dspsr software, plus beam model software to correct polarization properties)
 - Monitoring
- **Polarization Imaging (Cosmic Magnetism KSP)**
 - All-sky imaging from TBB data with polarization calibration from pulsar beamformed data (Köhler)
- **Spectrometer Mode (Solar KSP, EoR)**
 - Beamformed data processing (LuMP)
- **Long baseline correlation**
 - Recording and correlation of German stations
 - Will include ability to coherently combine station data for pulsar experiments
- **Transfer of ILT data from archive sites to Bonn**
- **Other projects...**



Example: Pulsar Timing at EF



- First LOFAR timing over significant timerange
- Limited to bright pulsars by 5 ns problem

Left: First verified LOFAR pulsar timing results (J Verbiest)
 Top Right: Pulsar timing covering 47 day range (J Verbiest)
 Bottom Right: Confirmation of timing model from higher frequency data (B Stappers)



Some of the Issues Important to EF

- **5 ns problem**

- EF less sensitive than one ear of a Core station
- Often cannot detect the brightest pulsar in the LOFAR sky because the station sensitivity is so bad

- Agreement on scheduling station owner's 10% time and unused ILT time prior to start of ILT science operations
- Station beamformer calibration
 - Should we be providing ASTRON with tables?
- LOFAR network configuration for sending German station data to EF
 - Requires new Foundry switch setups for EF and other German stations (Klaas?)
- New switch with more 10 GE ports to replace existing Foundry switch
 - Waiting for response from Klaas/Andre?
- Routine operations and emergency procedures manual
- ...



The End

