SA1: second year overview

Arpad Szomoru
JIVE

Outline

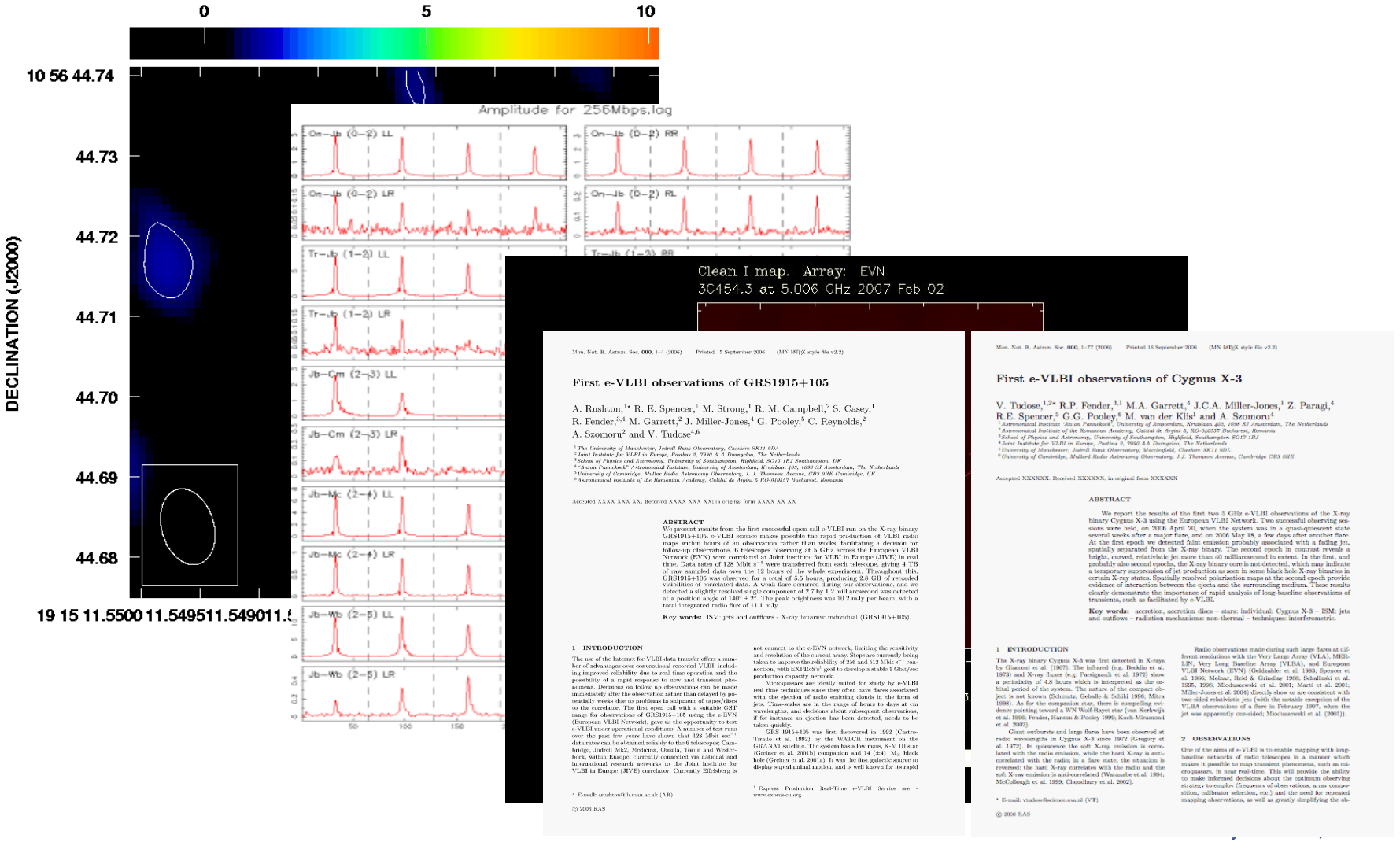
- Accomplishments in 2007
- Soft- and hardware developments
- Aims for 2008

e-VLBI science/test runs

- 18 e-VLBI science projects accepted since 2006:
- 2 failed (in early 2006)
- 8 active binary systems (Algol-type, X-ray or gamma-ray binaries);
- 4 of these were ToO projects, 3 part of multi-wavelength campaign
- 1 adaptive observation of 16 X-ray binaries (no detections..)
- 4 determination of compactness of calibrator or target
- 1 spectral line run
- 1 supernova ToO
- Last proposal still waiting for trigger

- Rapid access to EVN provides clear benefit to users (important for calibrator/multi-wavelength projects)
- Follow-up observations of bursting transients were only a moderate success in 2006; two weeks delay between proposal submission and observations is too long
- e-VBLI observing policy was changed in early 2007, to allow quick response to triggered projects (in 24 hours)
- Disconcerting lack of proposals (and triggers)

e-VLBI results



Operational improvements

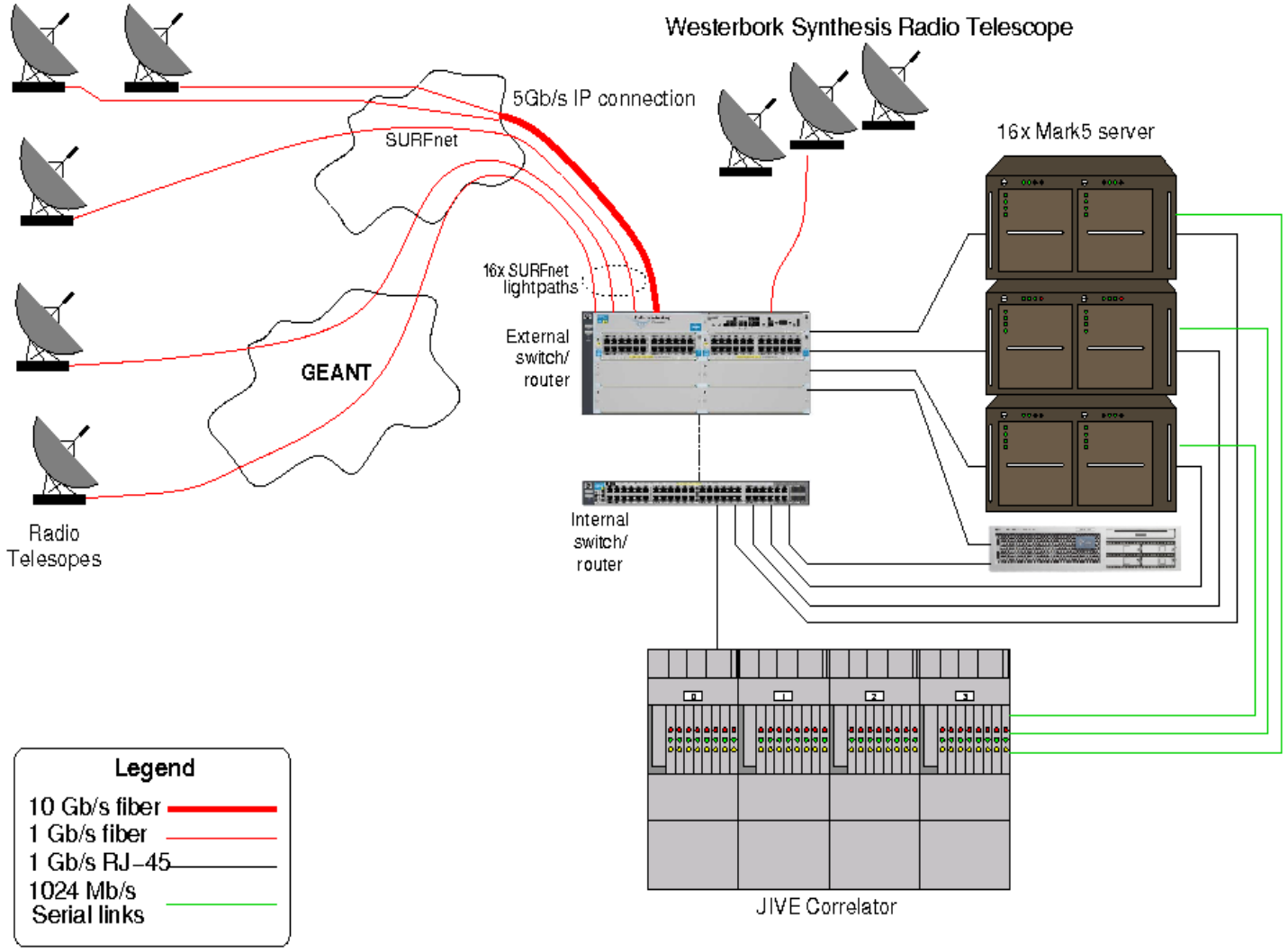
- Overall improvement in first year:
    - Robustness
    - Reliability
    - Speed
    - Ease of operation
    - Station feedback

- Minimizing data loss by careful scheduling
- Increase of production data rate from 128 Mbps to 256 Mbps
- 5-station fringes at 512 mbps
- Inclusion of Metsähovi and Medicina telescopes

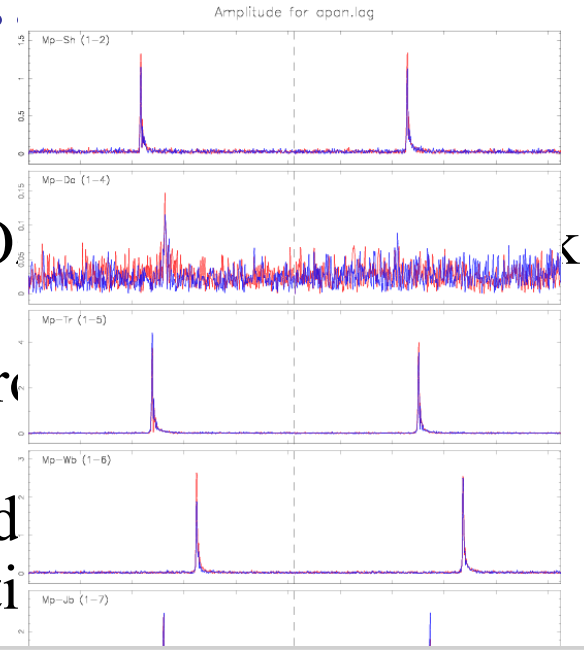
Operational improvements

- Main focus during second year:
  - Increase of network capacity (lightpaths)
  - Reliable high data rates
  - Operational efficiency
  - Hardware upgrade
  - Long-distance connectivity
- Demonstration of global e-VLBI (China, Australia)

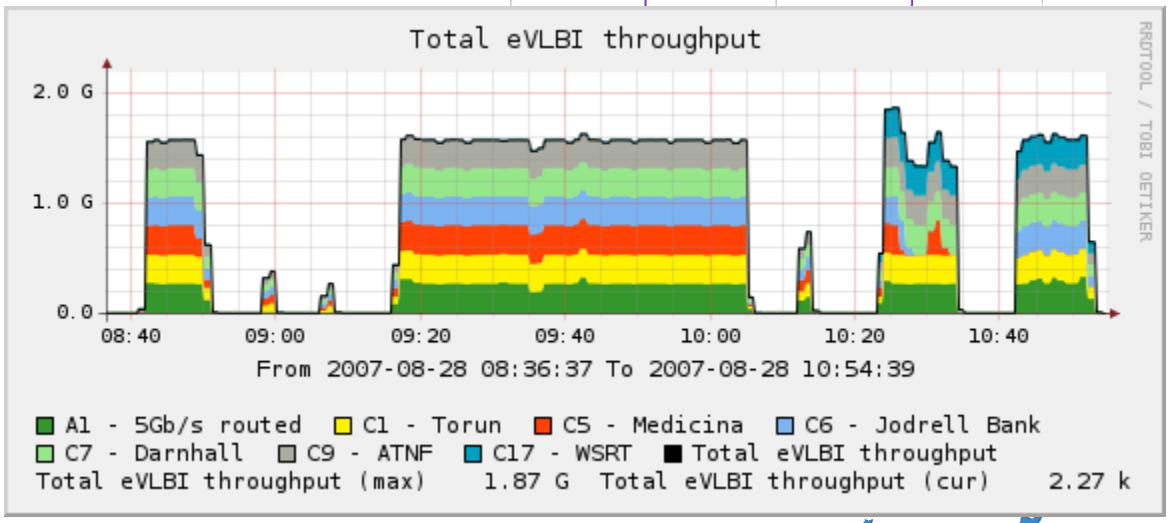
Network status e-EVN



Towards global baselines.



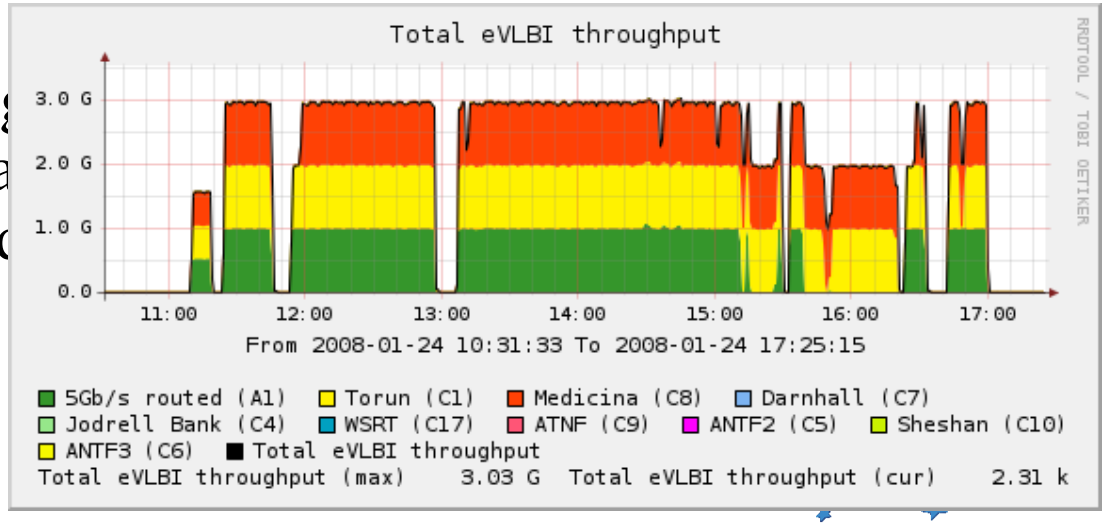
- Concentrated effort to make Xi'An and O[illegible]k
  - Impossible without local Mark5 contr[illegible] development
  - Use of alternative protocols, UDP and
  - Opening up of trans-Siberian connecti



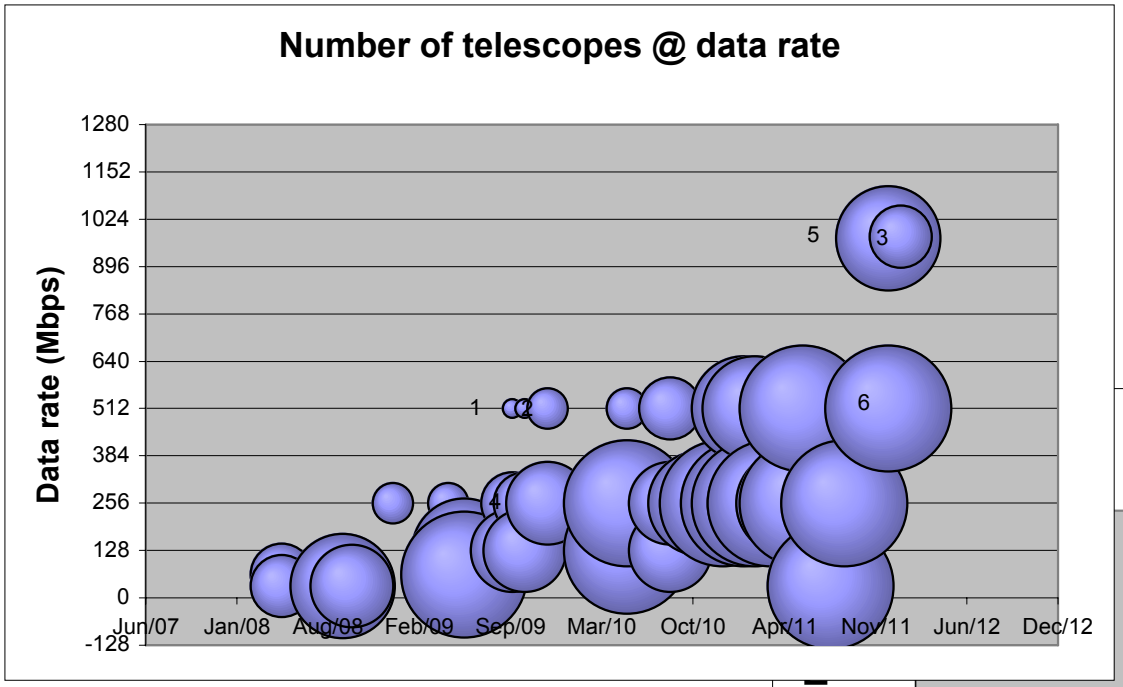
- Technical solutions
- Excellent PR
- Watershed?

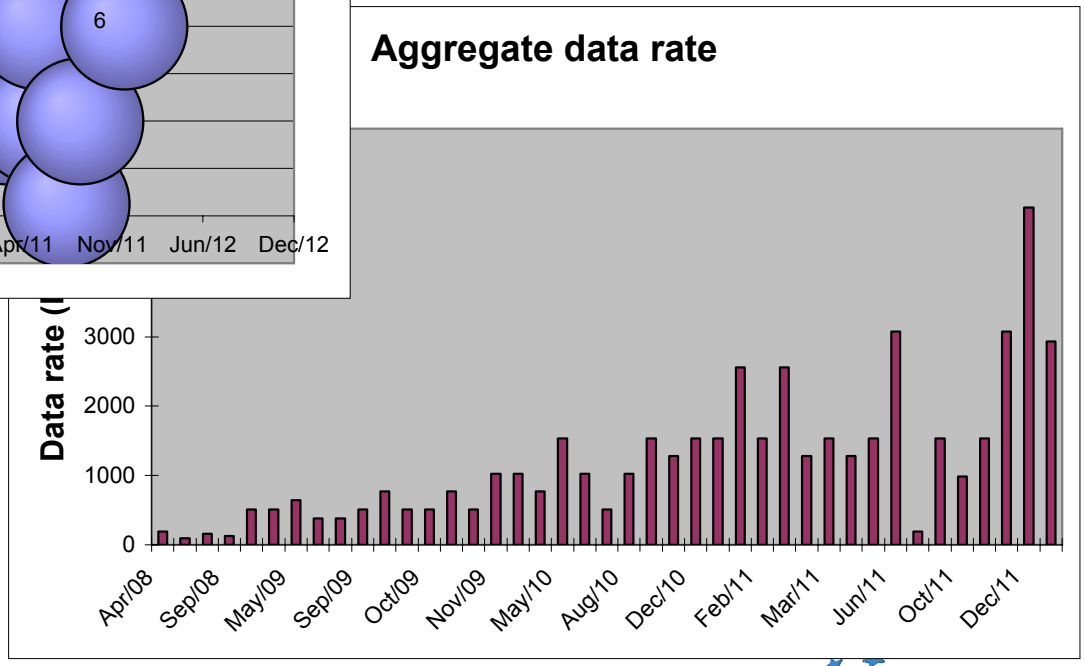
...and higher data rates

- Home-grown version of Mark5 control code
  - Much increased stability, speed
  - Deal with packet re-ordering, loss
  - Fill links to capacity by dropping packets at sending side, padding data stream with dummy packets at receiving side (courtesy of Casey and Hughes-Jones)
- Selective packet droppin
- Perfect synchronization a
- More demanding for hard



Data rate improvements





...and various operational improvements

- Reconnecting stations on-the-fly
- Use of WSRT synthesis data for e-VLBI calibration (absolute flux calibration, polarization calibration, source selection)
- Space-craft tracking mode
- Station feedback

Mark5 upgrade:

- e-VLBI capability in Mark5B (nonexistent)
  - Dimino most important for now, will allow stations to move to B
  - Results expected within 1 month
- Mark5B playback at EVN correlator
  - First fringes
  - But some issues remain

Ongoing/upcoming software developments

- On-the-fly fringe fitting
- Real-time download and extraction of station information
- Automated correlator diagnostics
- Investigation of a 1024M sub-array

- Adaptive observing

And more global connections

- Arecibo at 512 Mbps (for limited periods)
- But 128 Mbps continuously
- TIGO: opportunity to increase bandwidth to ~500 Mbps (for demo purposes)
- Ef currently connected, tests planned
- Yb: getting close to first tests
- Chinese telescopes back in business soon (rumors of fast connection to Ur)

- Demo during TERENA 2008, in Bruges, Belgium
- Key-note address on e-VLBI
- Ar, TIGO, Mc, On, Wb, Ef (?)

End of 2008:

- Flexible scheduling
- Provide global baselines
- Access to big dishes
- Guaranteed high data rates

- “real” e-VLBI capability

- Turn-over point