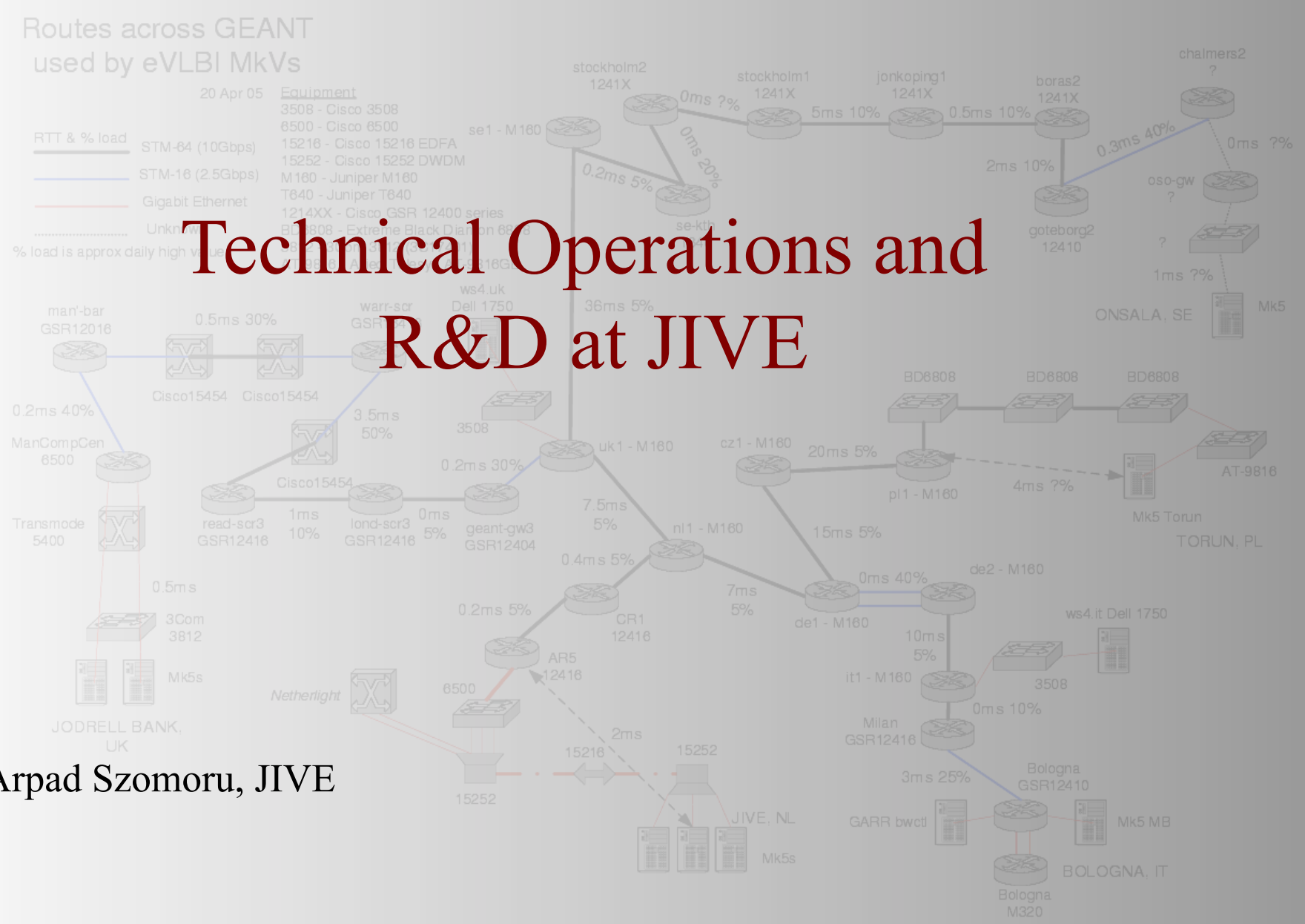
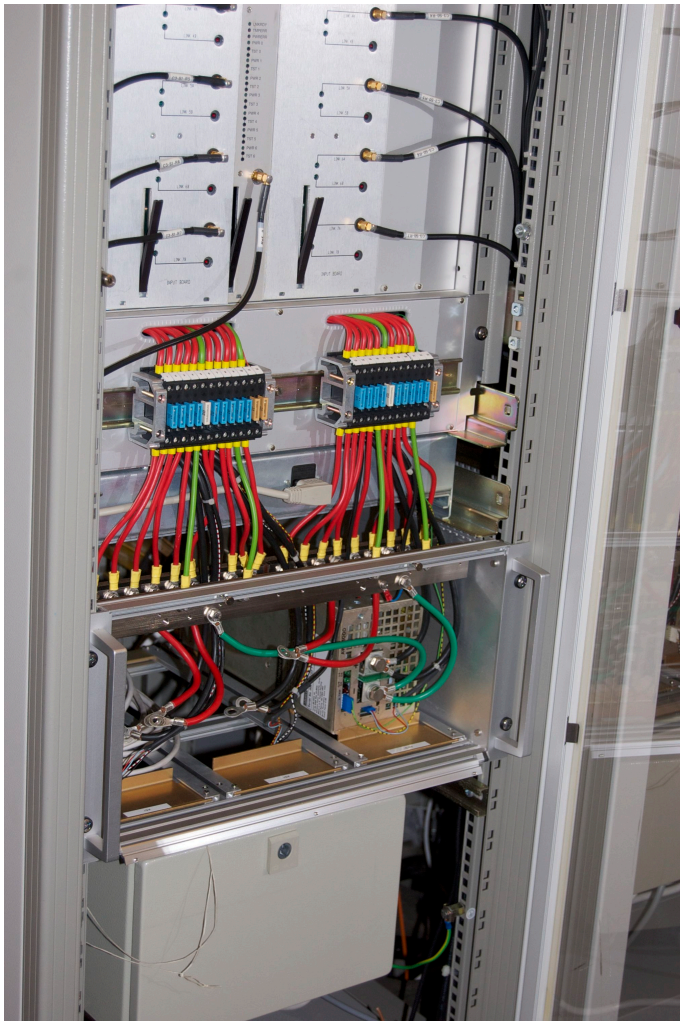


Technical Operations and R&D at JIVE

Arpad Szomoru, JIVE

Mark5, SUs, MarkIV correlator

- Mark5, general
  - SDK9 now the standard
  - Newer Linux kernel + newest SDK still break e-VLBI
  - Stick to old Linux with newest SDK
  - All Mark5s (being) upgraded to Lenny
  - Paul Boven to investigate problem further
- Mark5B/C
  - 2 units permanently converted to B
  - 1 extra unit currently B+, 6 C units in place
  - 1 C unit on loan to Yebes
  - 1 C unit on loan to Torun for DBBC verification
- SU
  - Turned off
- MkIV Correlator
  - Turned off
  - and being cannibalized….



Out with the old, in with the new…

- New correlator control computers

- Dual redundant machines
  - Running virtual servers
  - Clustered filesystem; live migration of services
  - Dual processor 6-core Intel E5 Xeon 2.3 GHz
  - 64G memory, 128G SSD, 10GE

Jive5AB

- Jive5ab has taken over most operational VLBI in EVN
  - No major show stoppers, mishaps
- Much development ongoing
- Talk by Harro Verkouter

e-status

- Full 1024 Mbps available from most stations
  - Ef, On, Nt, Mh, Hh using DBBCs operationally
  - Tr, Mc, Yb doing tests
- Channel dropping possible when needed (except Ar)
- Sh upgraded from 512 Mbps to 1024 Mbps!
- Ar still at 512 Mbps
- Irbene: full EVN member in 2015?
- Progress in attempts to bring e-Merlin back into array
  - SFXC installed at Jb for tests

SFXC Correlator

- Used for all EVN operations, both recorded and real-time:
  - E-VLBI with 13 stations at 1024 Mbps

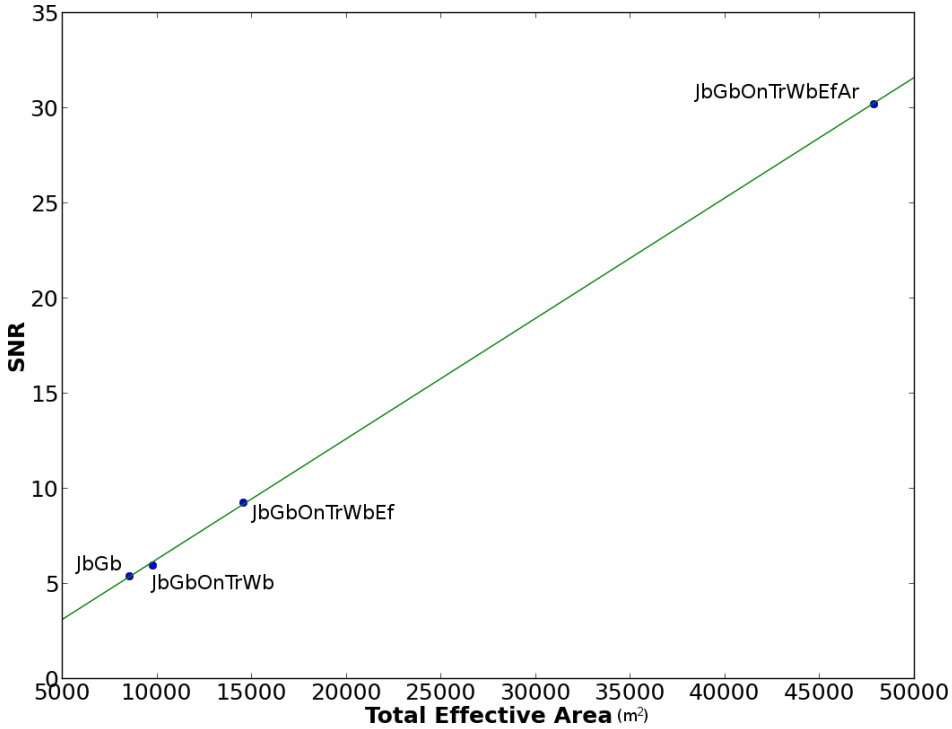
- Ongoing developments:
- Coherent de-dispersion
- Multiple phase centers in real time!

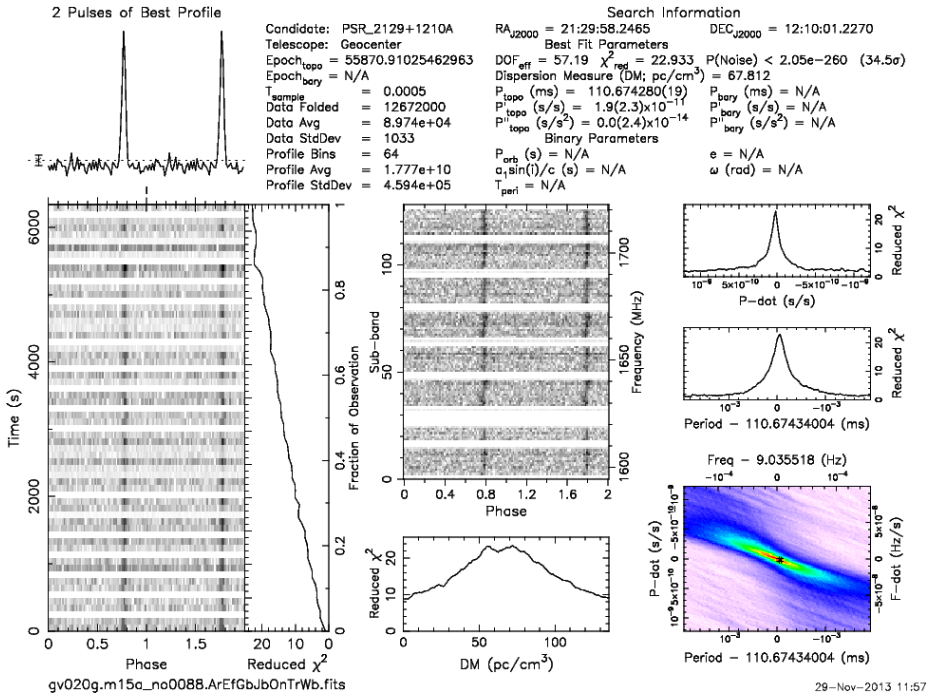
  - 2048 spectral points, 50ms sub-integrations
  - 10% loss of amplitude at 5’ from pointing center
  - 13 stations (without cross correlations)

  - 4096 spectral points, 25ms sub-integerations
  - 5% loss of amplitude at 5’ from pointing center
  - 11 stations (without cross correlations)

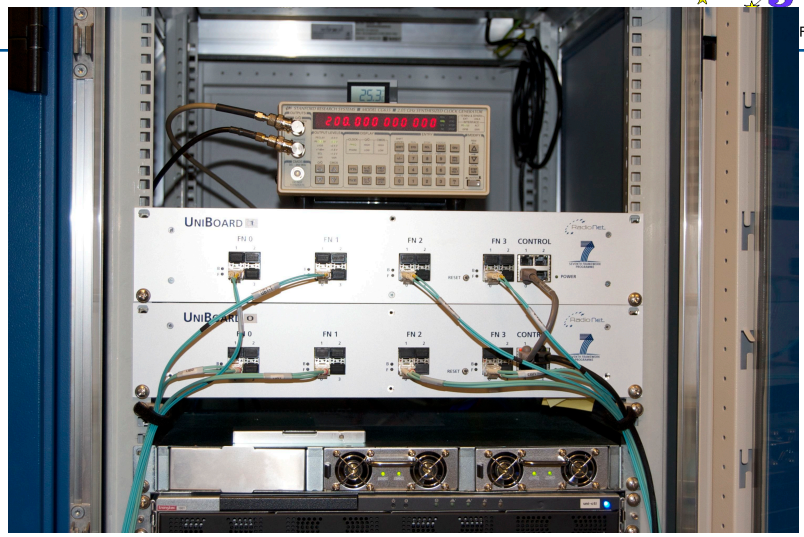
SFXC Correlator: phasing up the EVN

- Phased array mode
- Coherent summing of signals
- Mult. phase center capability for phased array mode under development
- Implementation at KVN





UniBoard and beyond



- UniBoard-based EVN correlator
  - Major re-write of large and complex module
    - Some serious debugging ongoing
  - All bits ready, but not quite in place
    - Playback from Mark5 units
    - With on-the-fly conversion to VDIF
  - Official project scientist appointed
    - Who will force developers to come up with working system…
  - Project review planned before summer 2014
- UniBoard^2
  - Prototype will use 20nm FPGA technology
  - Some (or all?) production boards with 14nm (pin compatible)
  - Main board, optimized for use as AA-low beam former
  - Full mesh, Hybrid Memory Cubes and QSFP+ cages on break-out board