

Strengthening Astronomy in the North

Group overview, plans and thoughts for strengthening
technological training

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Group overview

- Our focus is on Radio Astronomy Technology.
- The group comprises 3 academic staff, one of whom is focussing on outreach.
- We have 6 Masters students and 14 undergraduates, including 5 from the African partner countries.
- We started with a "bottom up" approach.
- What we have learnt may help others.



We currently have 4 different radio telescopes



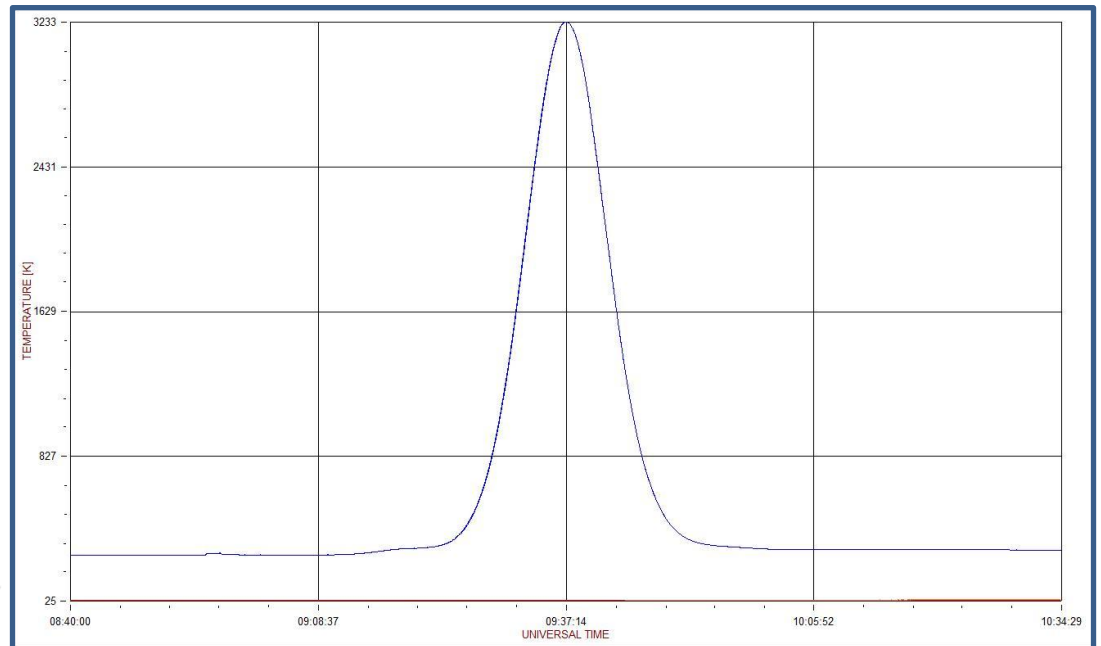
Strengthening technological training- an example

- We have sourced, or developed, a number of simple experiments that practically demonstrate many of the fundamental concepts in Radio Astronomy.
- At the HCD workshop in September 2012 we proposed to offer a short course on an Introduction to Radio Astronomy Technology.
- Resulting from this we ran a 1 day workshop in December 2012 for a group of undergraduate students from UNISA and UKZN.
- Some of these experiments include the following:

Using a pin-hole camera to measure the diameter of the Sun.



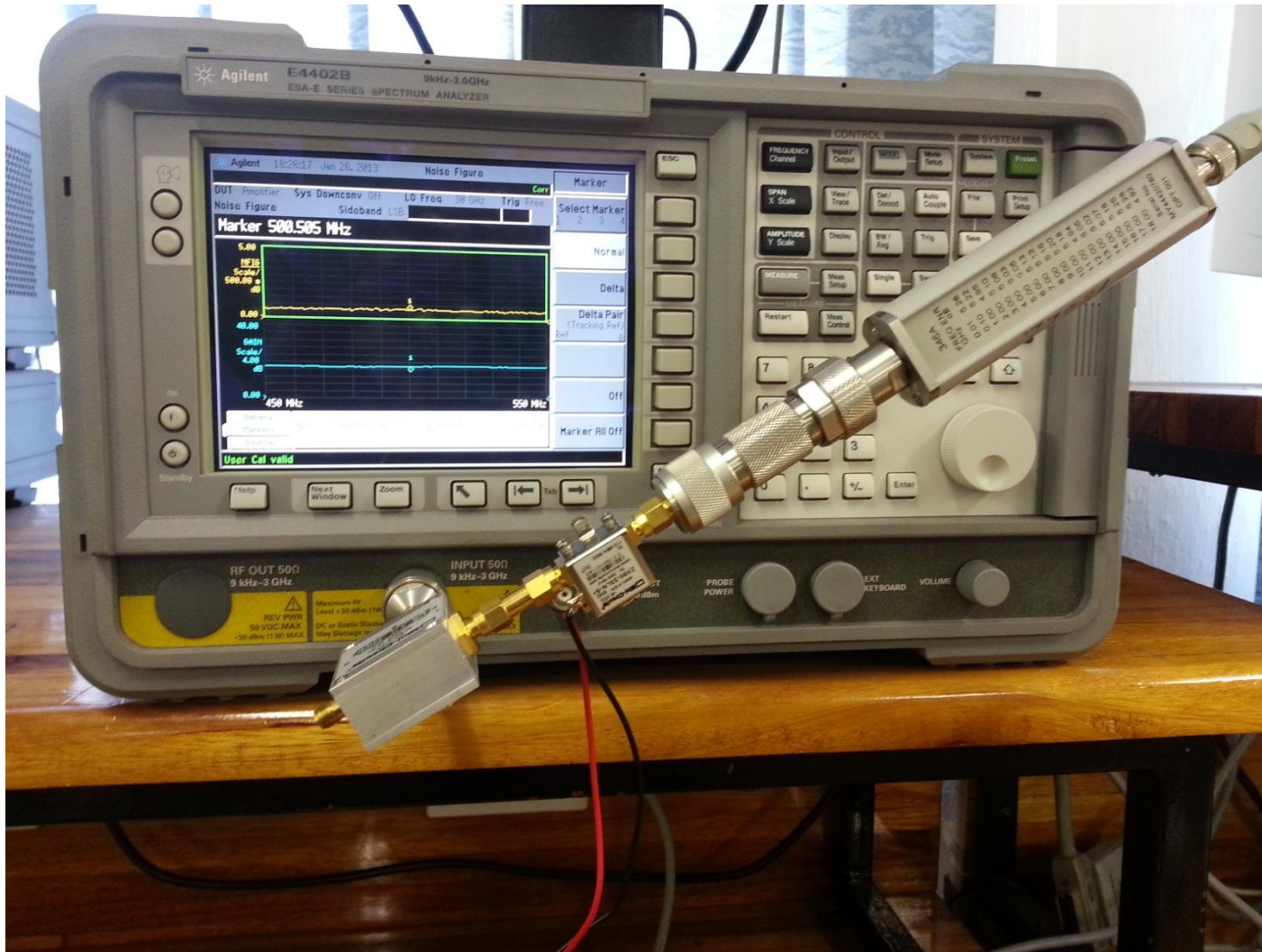
Using a parabolic reflector antenna and the Sun to measure the telescope beamwidth.



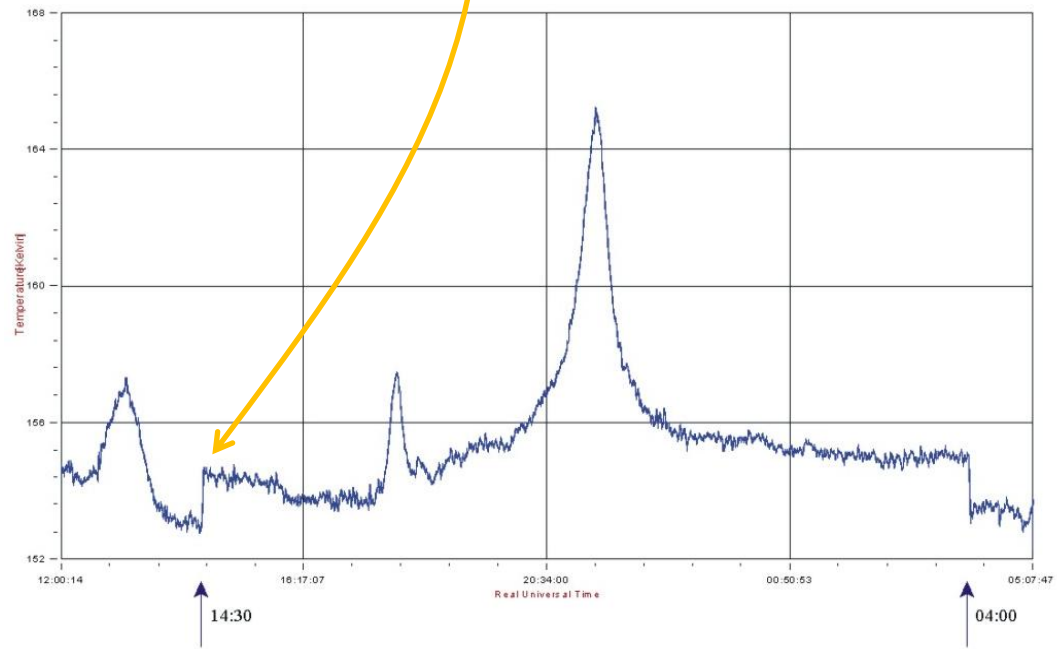
Using a DSTV dish to measure the brightness temperature of the Sun (courtesy Mike Gaylard).



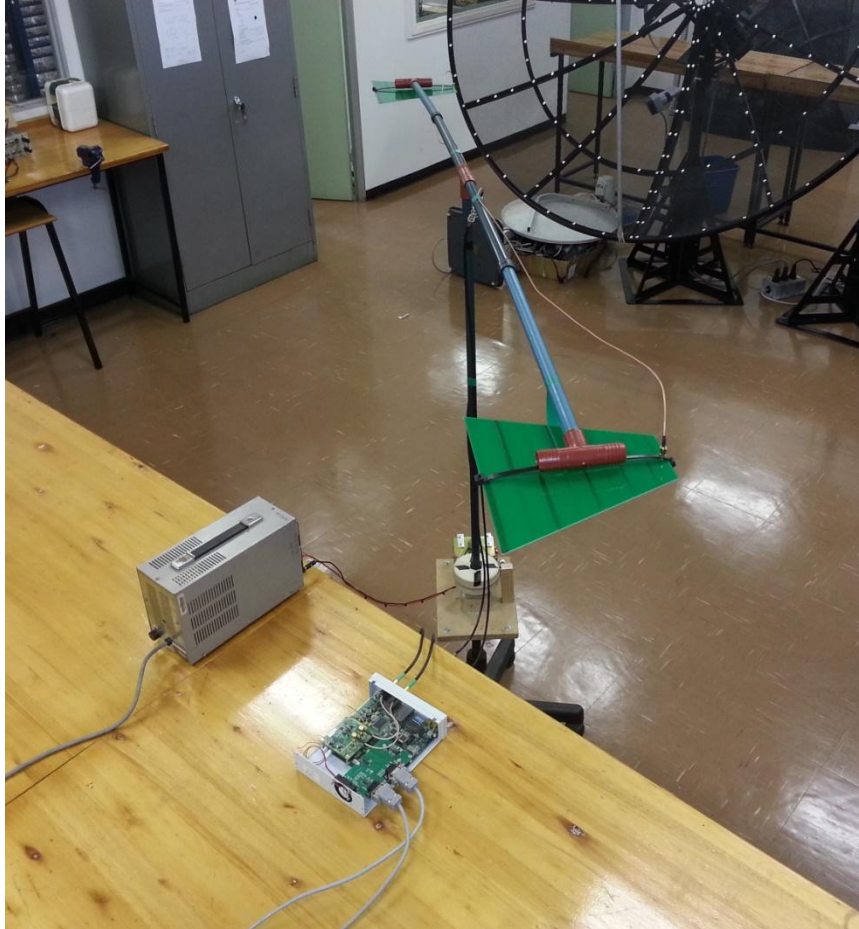
Measuring the system noise temperature (T_{sys}) of a receiver.



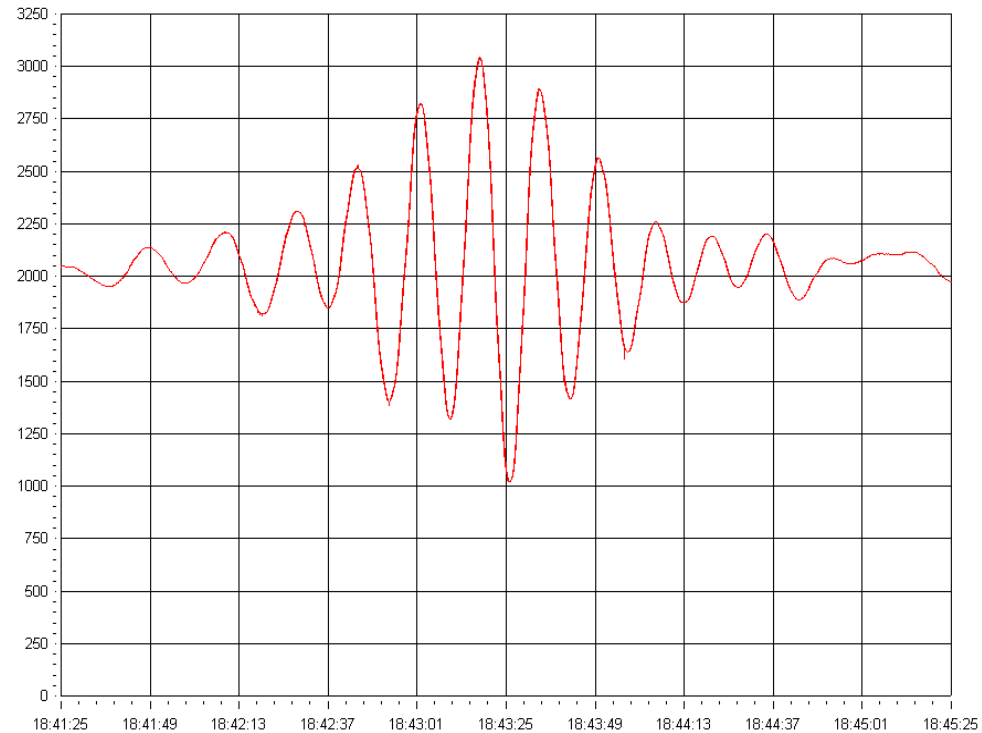
Illustrating the effect of RFI on receiver sensitivity.



Using a simple rotator with 2 antennas and a correlator to demonstrate interferometry.



868 MHz -10 dBm
Approx. 10m TX to RX
RX gain setting 095
2 m baseline
180° in 4 minutes



Plans for the future

- Enhance the workshop programme from lessons learnt and encourage participation from other institutions.
- Include a Radio Astronomy Technology option in the curriculum for the new degree due to be implemented in 2014.
- Expand the outreach programme in collaboration with UKZN.
- Continue to strengthen the relationship within the KZN Astronomy Group (UKZN, DUT, MUT and UNIZUL).

Questions?