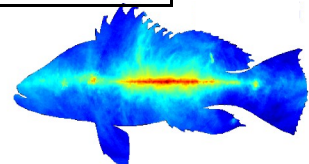
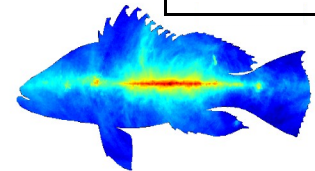


Charles Copley
University of Oxford

Sky-coverage	All-sky
Angular resolution	0.73 deg (43.8 arcmin)
Sensitivity	< 0.1mK r.m.s
Stokes coverage	I, Q, U, (V)
T _{sys}	~20K, including sky
Frequency	1 GHz bandwidth, centered at 5 GHz
Northern site	OVRO, California Latitude, 37.2 deg
Southern site	MeerKAT site, Karoo, South Africa Latitude -30.7 deg

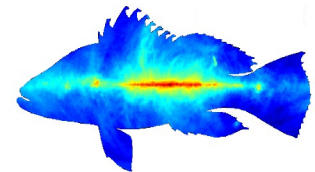


Primary aims:

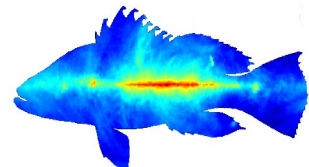
- To provide all-sky maps in I, Q and U at 5 GHz for the community.
- To allow more accurate subtraction of the polarized Galactic synchrotron emission from e.g. WMAP, Planck and future B-mode experiments.

Secondary aims:

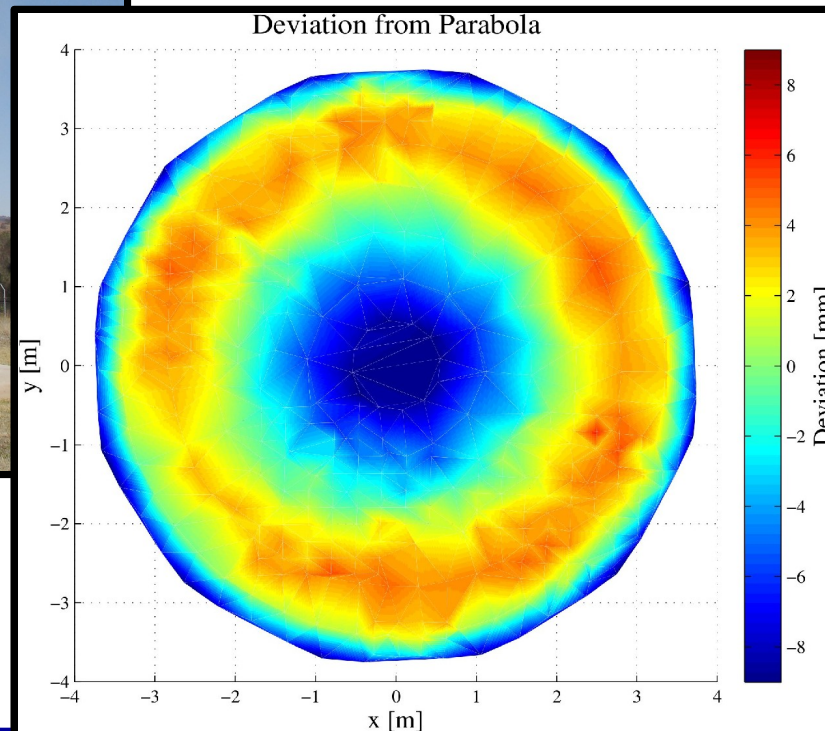
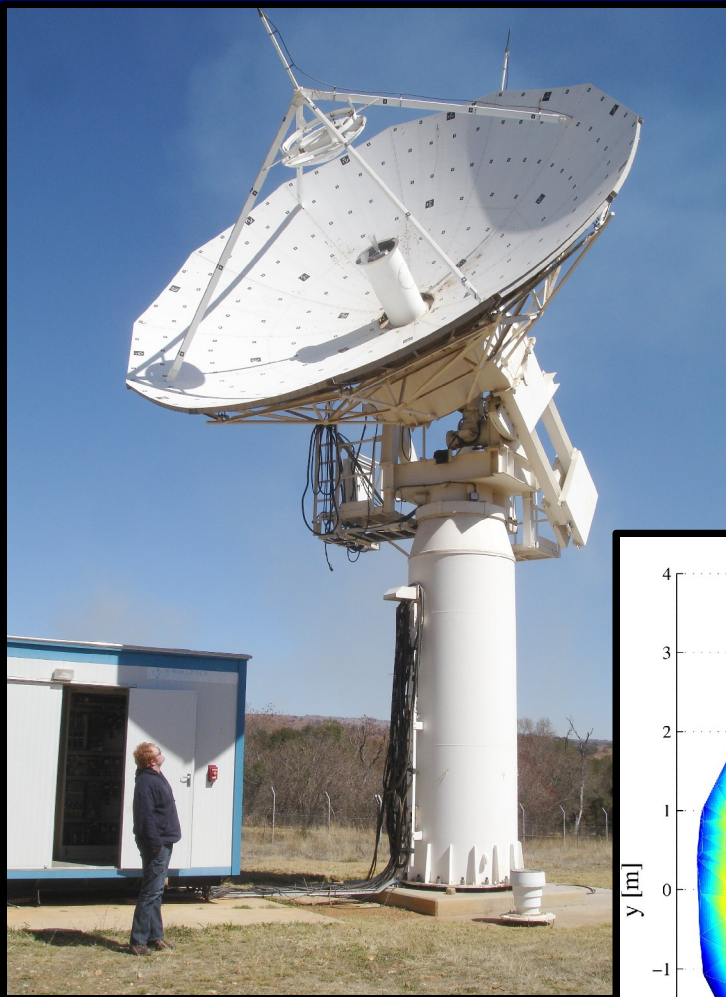
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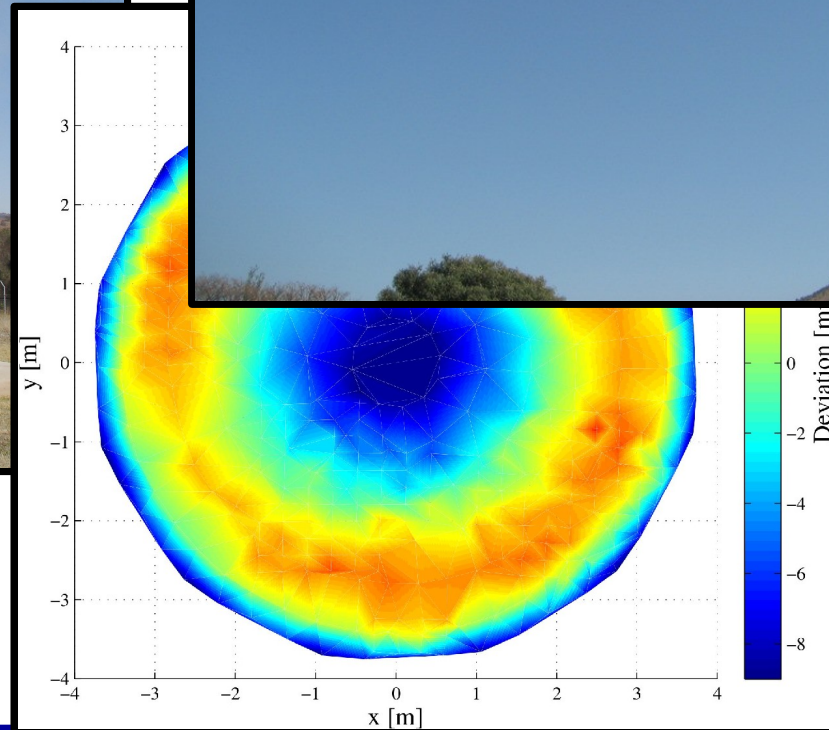
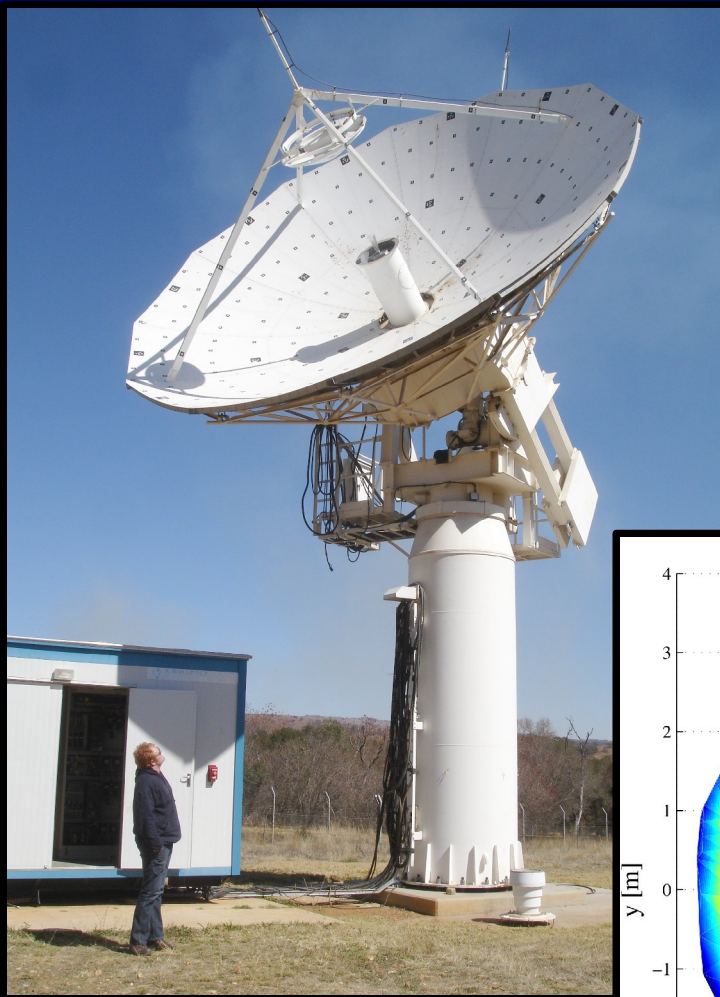


....to name but a few

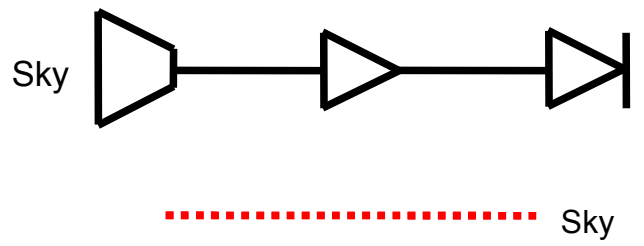




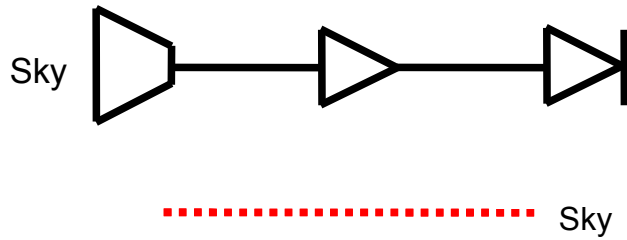




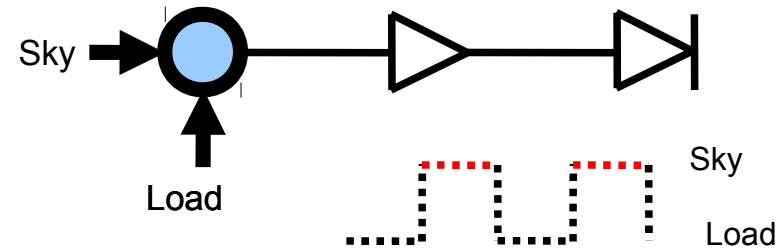
Total Power Radiometer



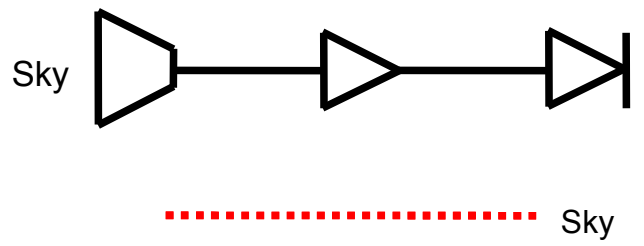
Total Power Radiometer



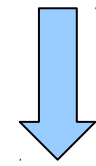
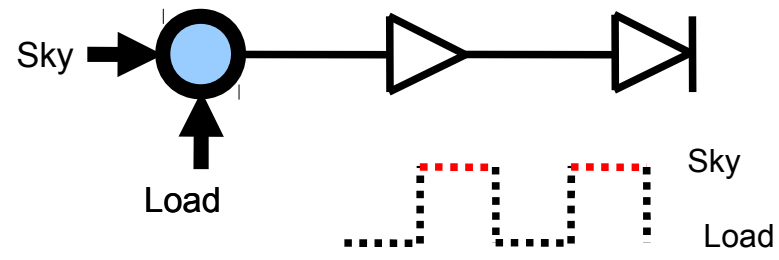
Dicke Switching



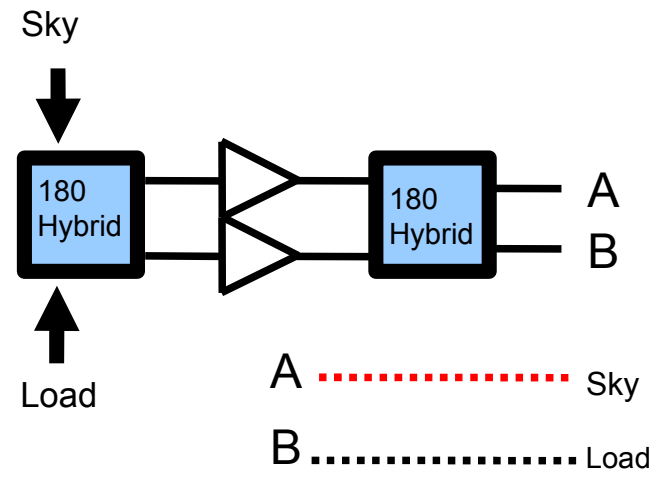
Total Power Radiometer



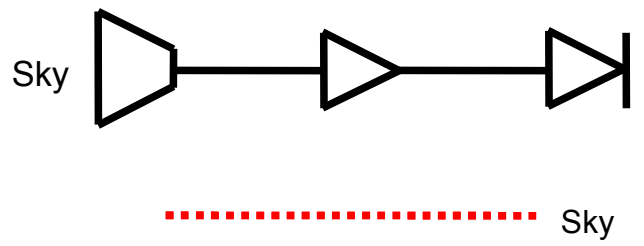
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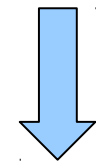
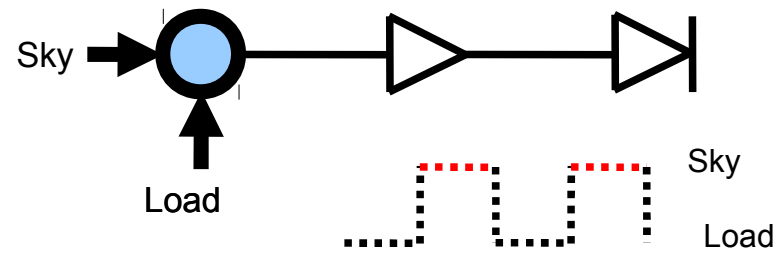
Continuous Comparison



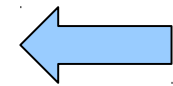
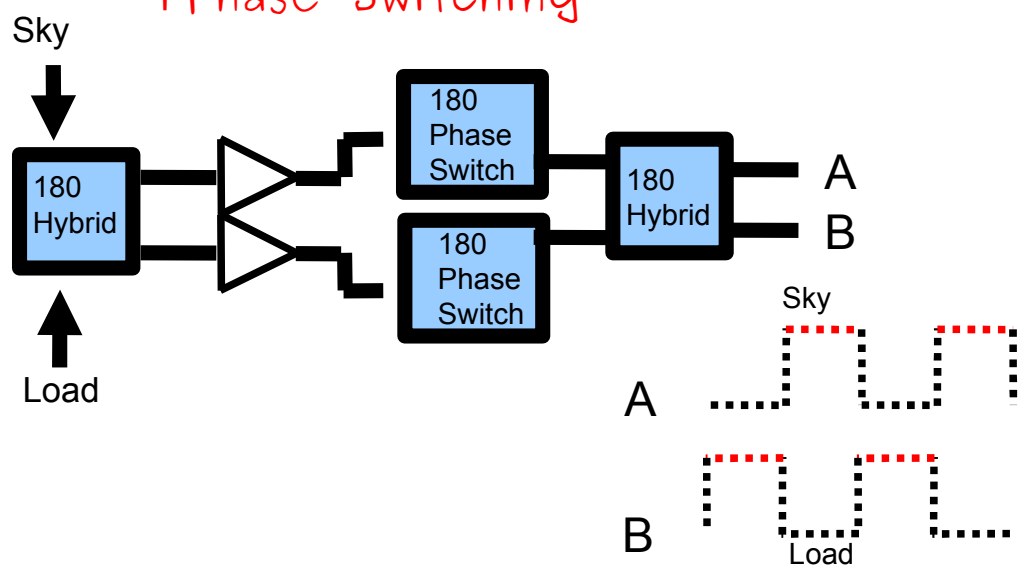
Total Power Radiometer



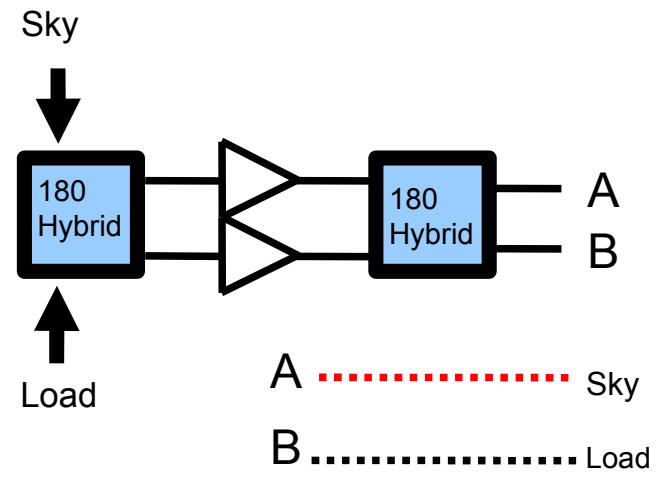
Dicke Switching



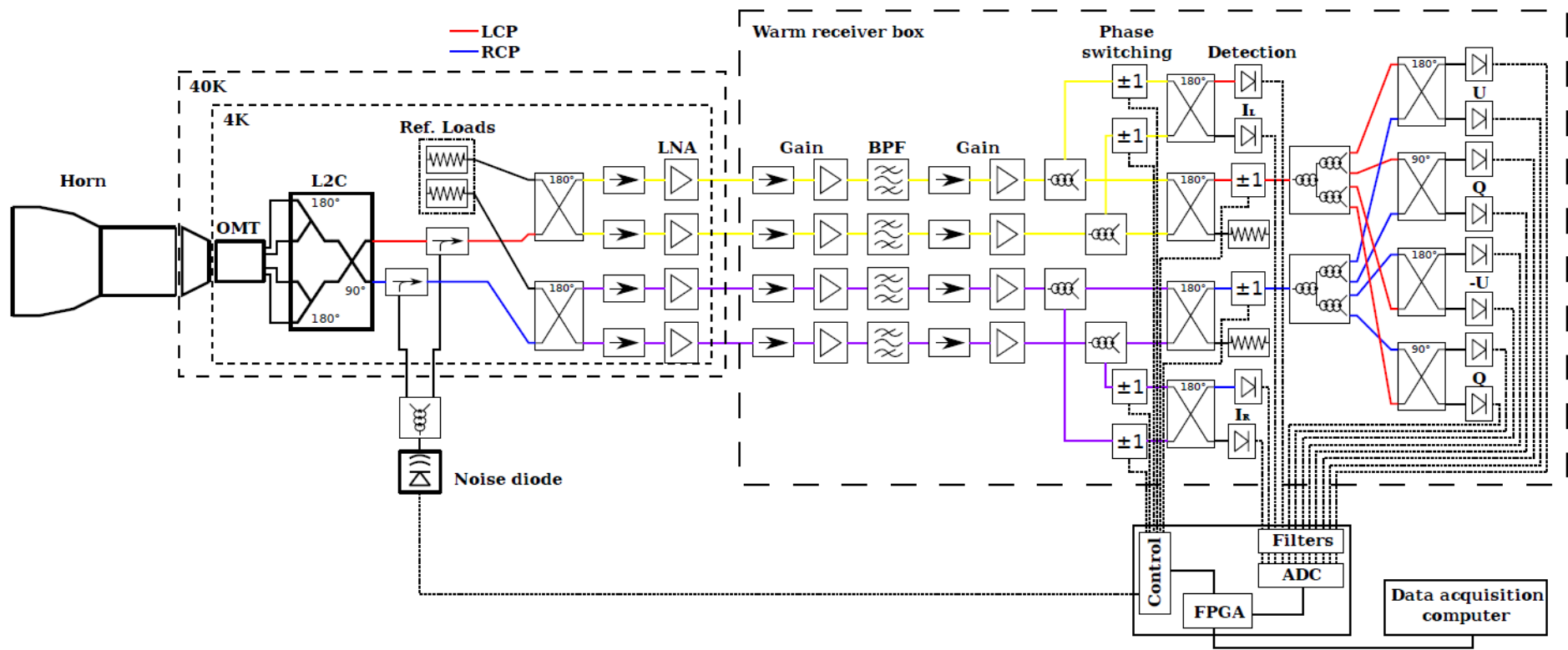
+Phase Switching

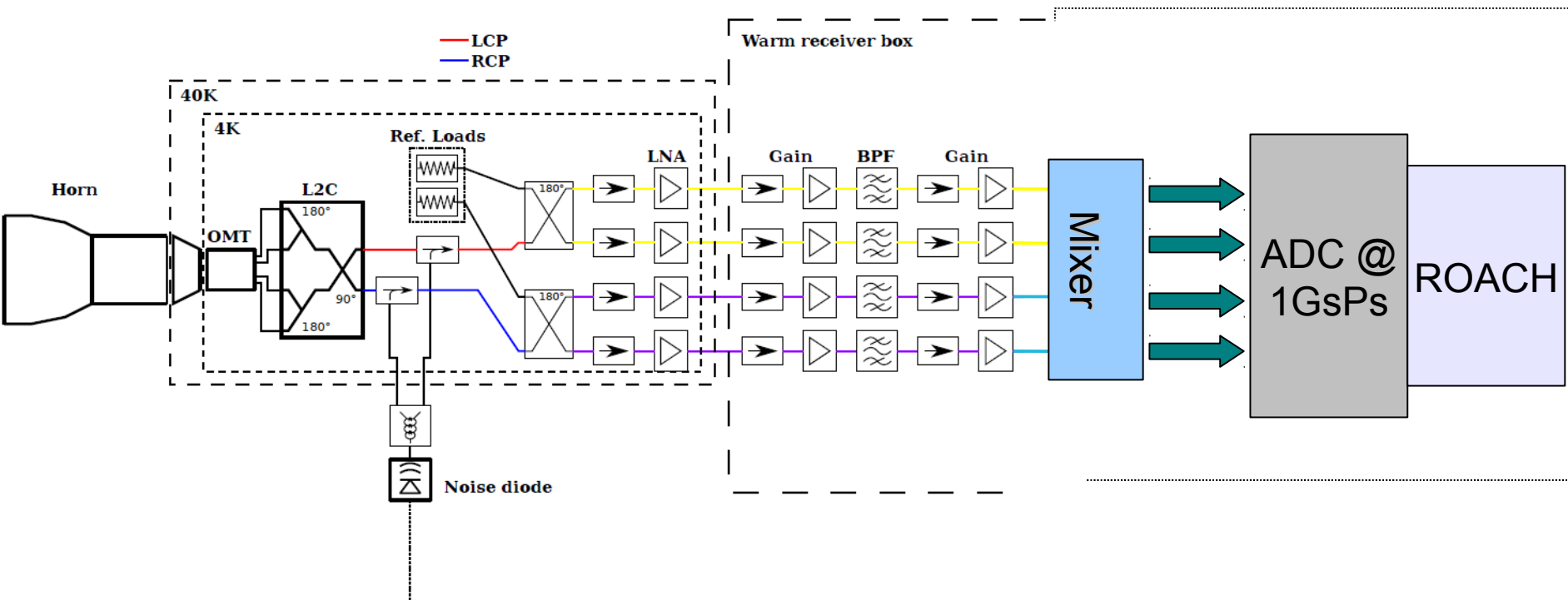


Continuous Comparison

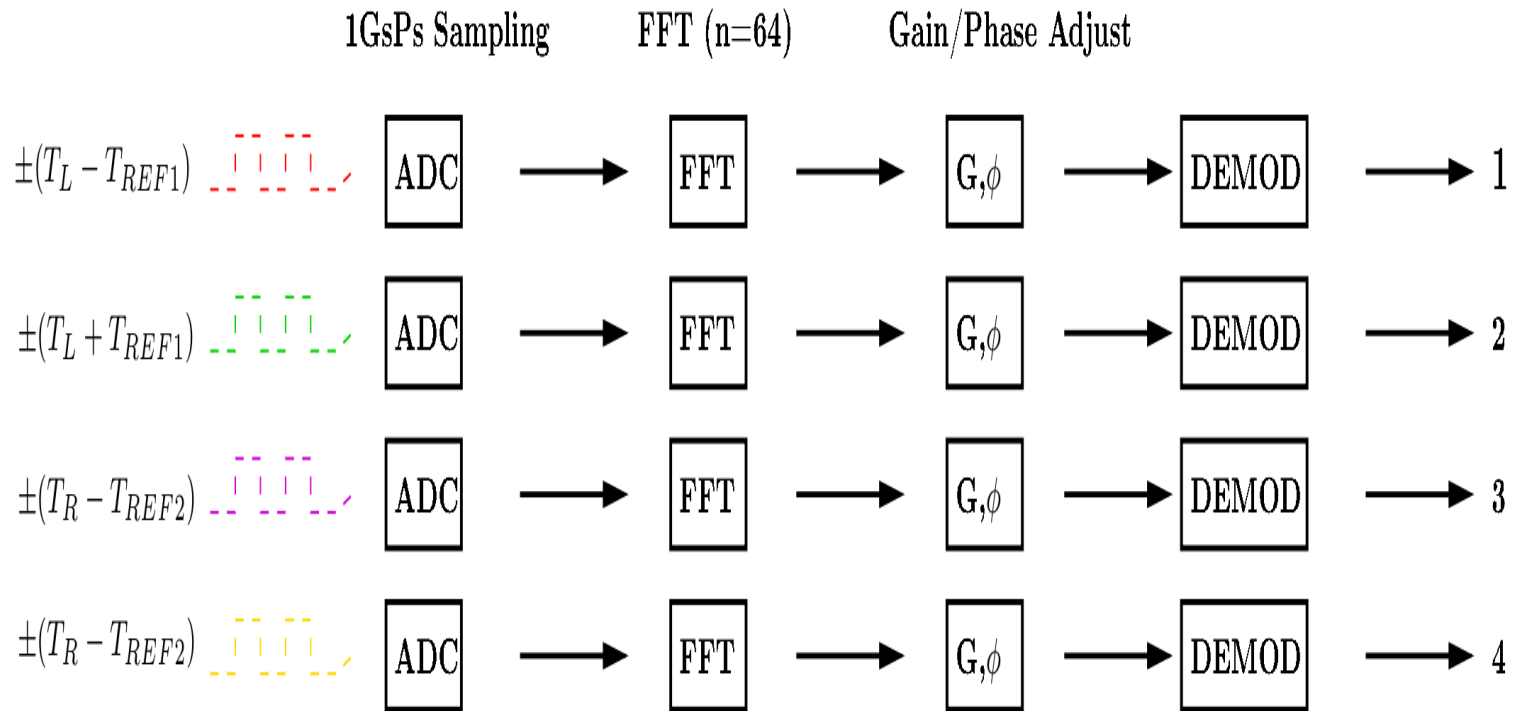


Northern Analog Receiver

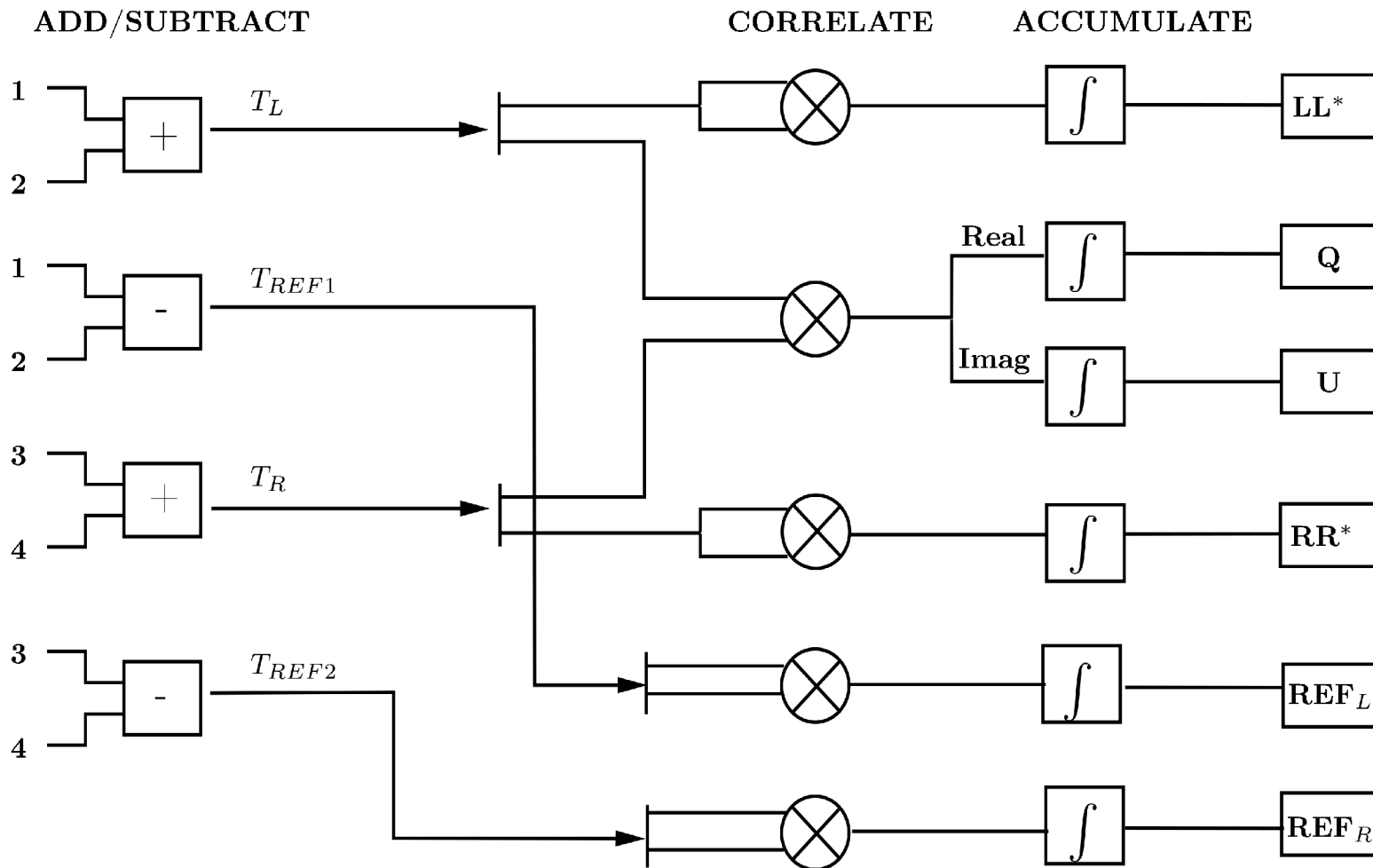




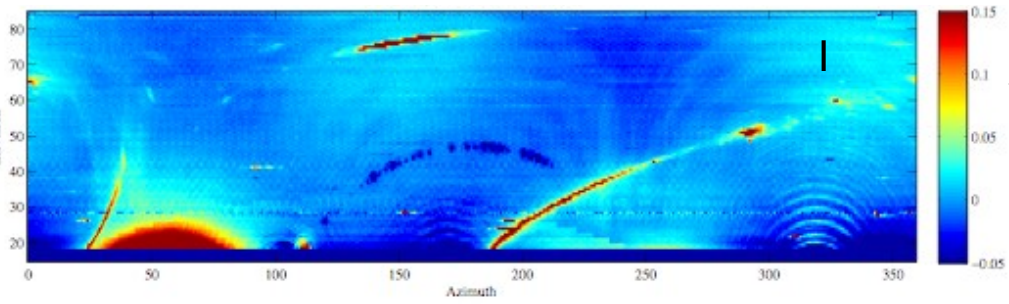
SIGNAL PRE-CONDITIONING (PER 500MHz BAND)



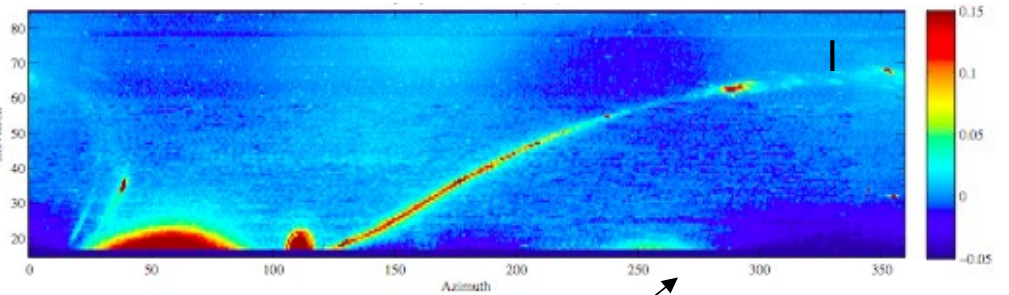
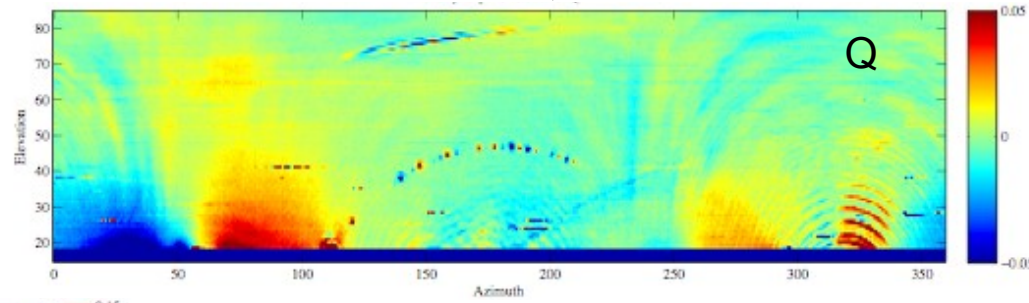
DIGITAL POLARIMETER (PER 500 MHZ BAND)



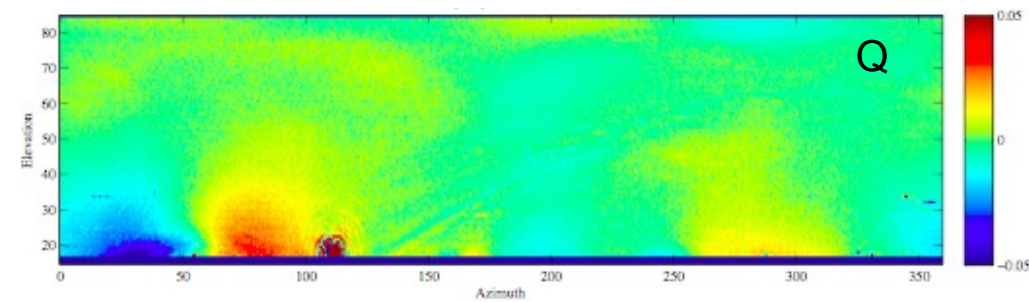
C-BASS North Site RFI

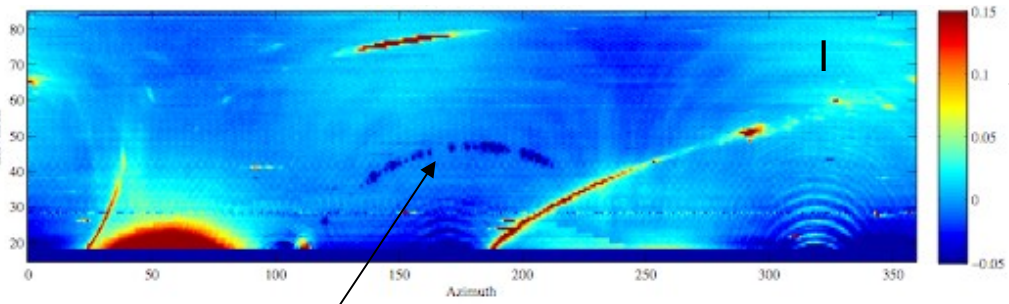


Before installation of notch filter (in-band) and second bandpass filter



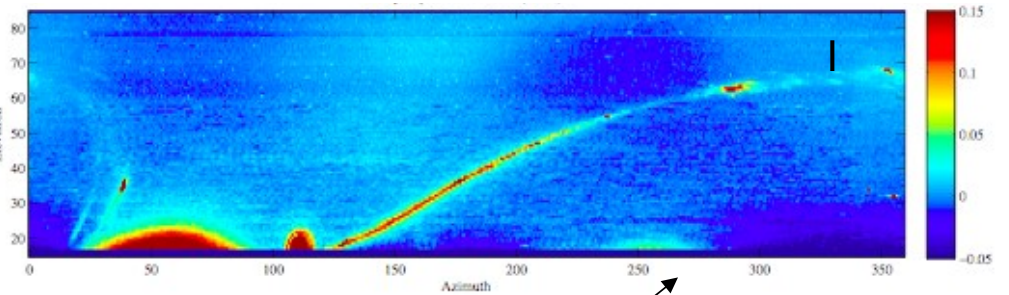
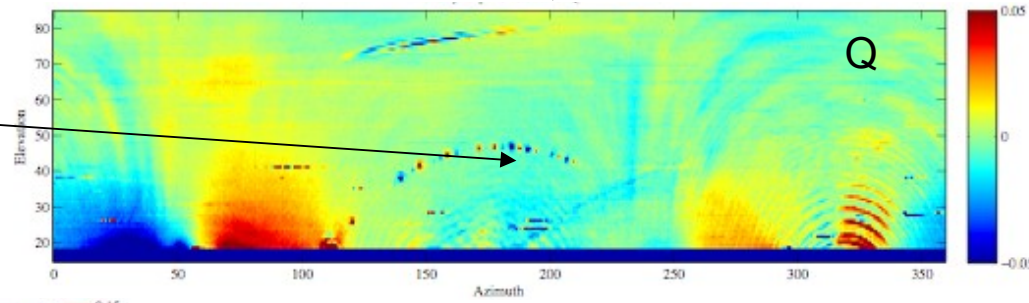
After installation of extra filters



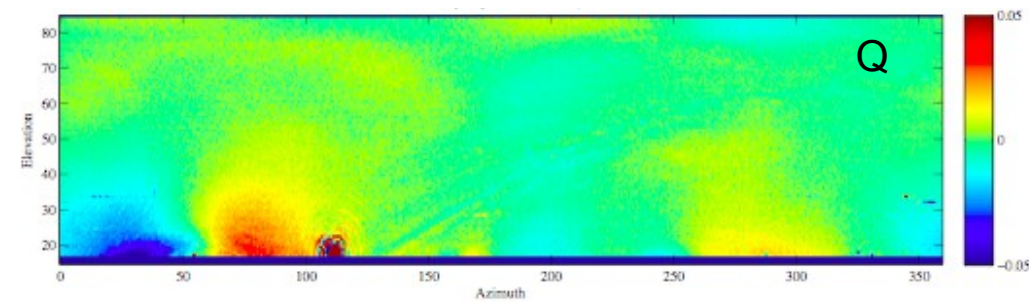


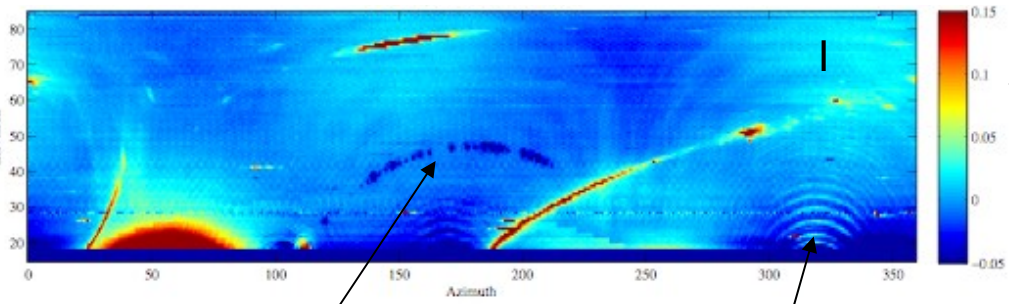
Before installation of notch filter (in-band) and second bandpass filter

Geostationary Satellites



After installation of extra filters

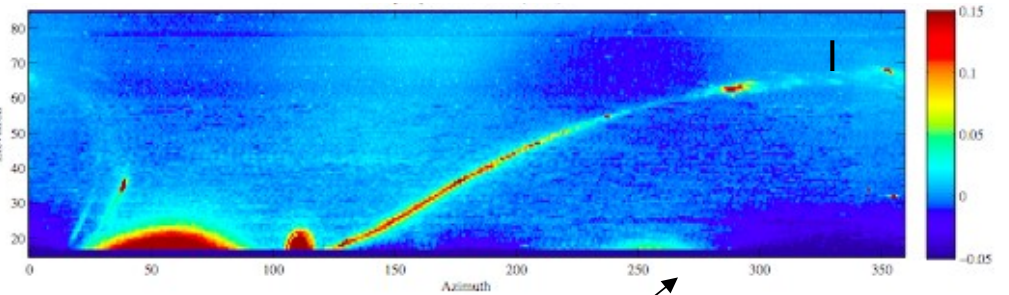
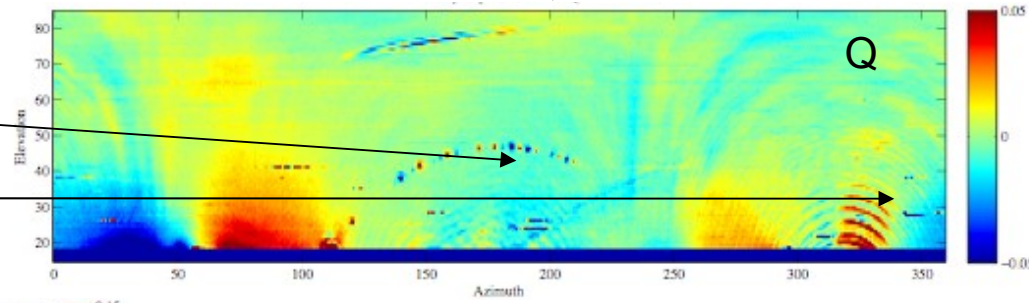




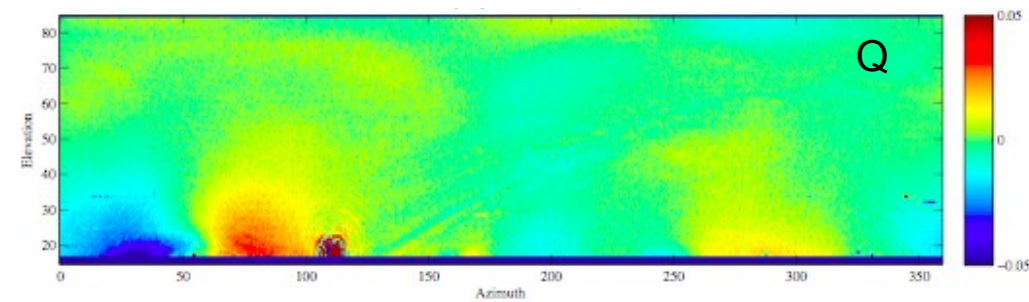
Before installation of notch filter (in-band) and second bandpass filter

Geostationary Satellites

Terrestrial RFI



After installation of extra filters

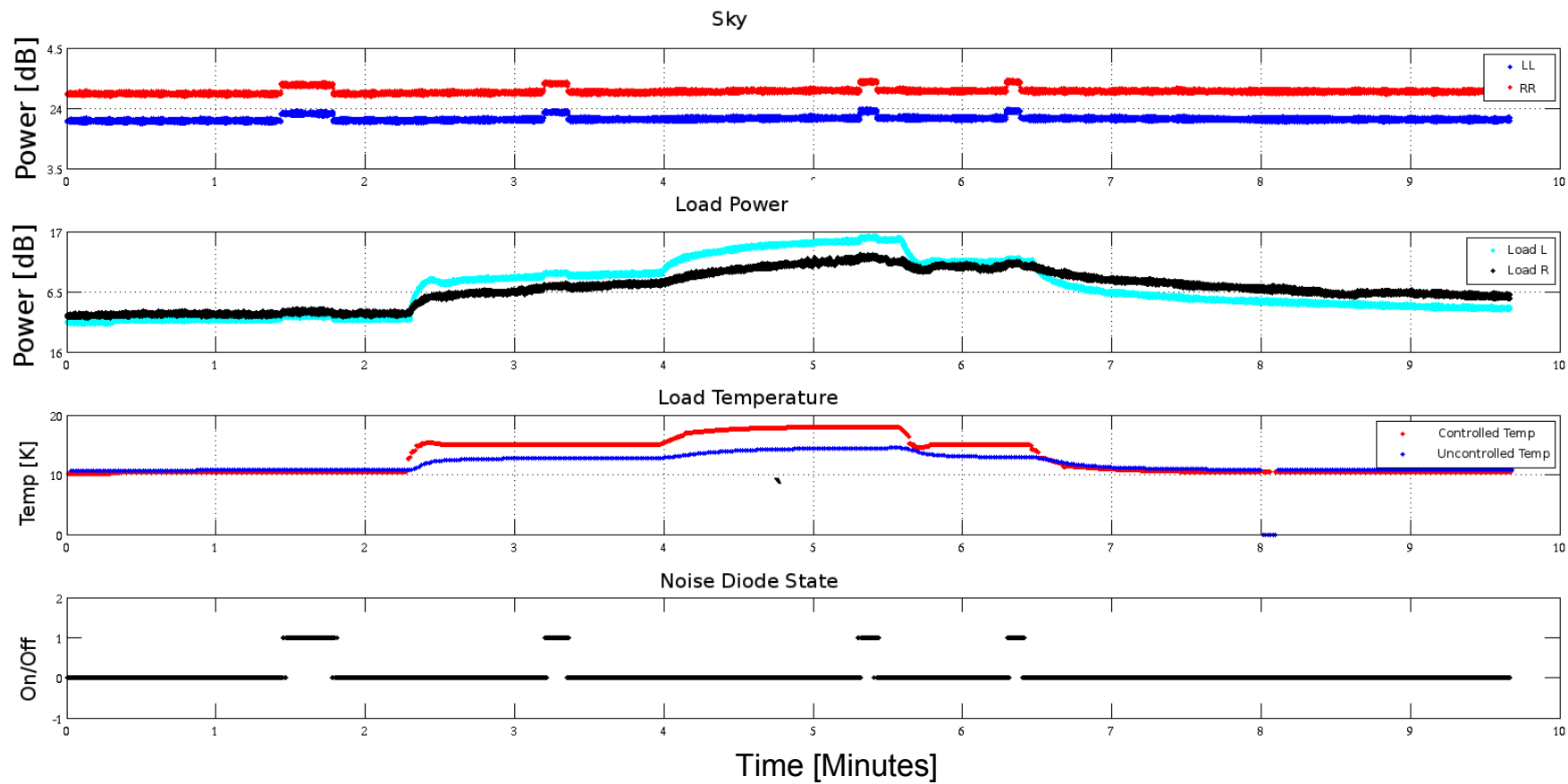


Community Base

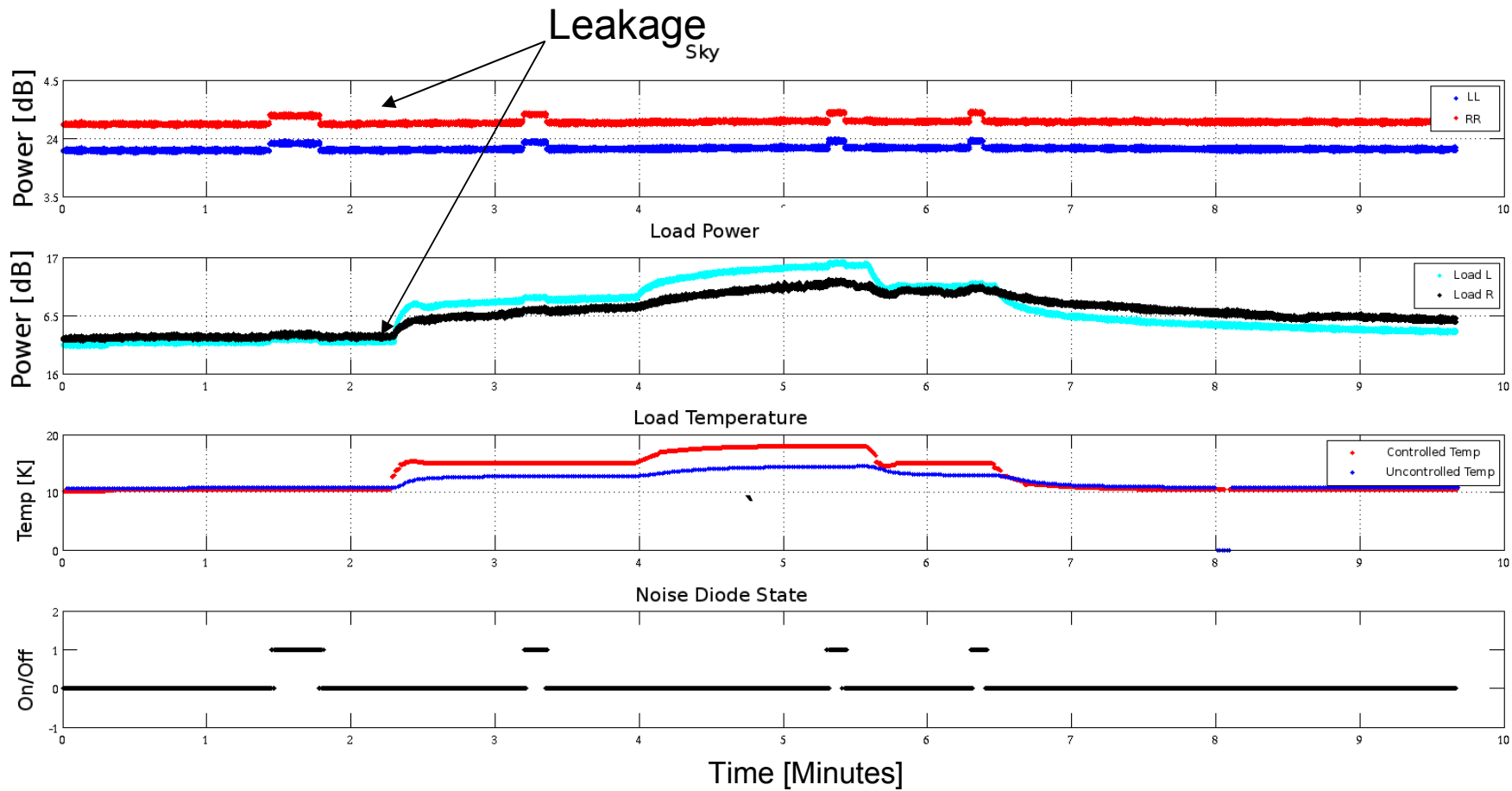
- Xilinx Virtex 5 based generic FPGA board
- Community maintained Toolflow
- Multiple ADC Options
- 4RF Channels @500MHz
Bandwidth per ROACH



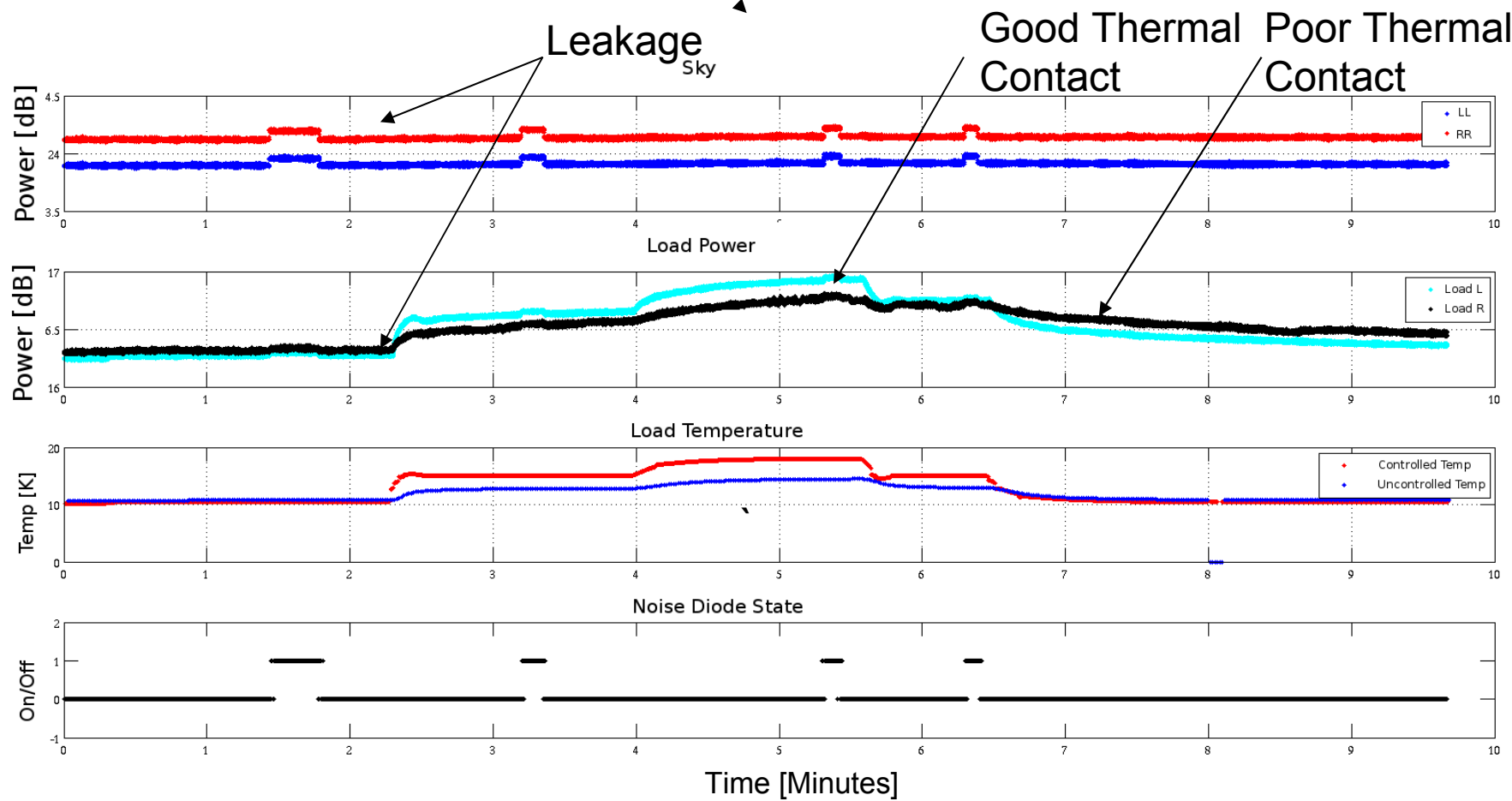
Intensity Data



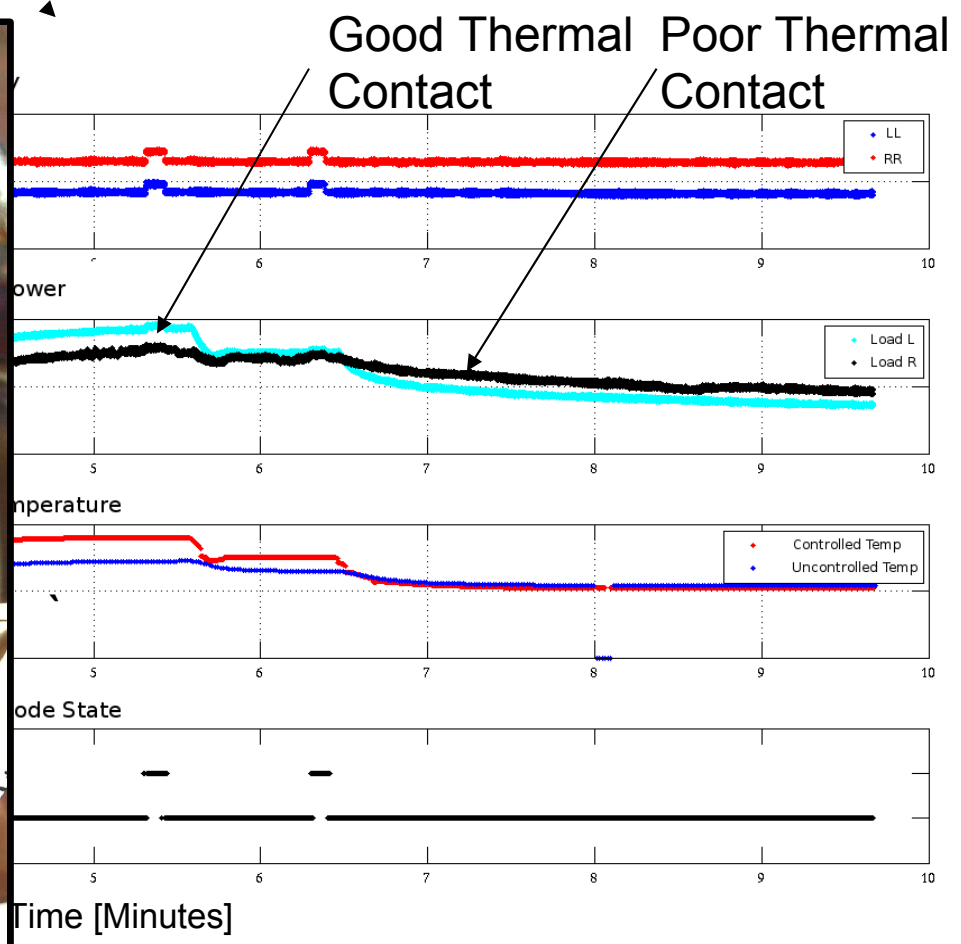
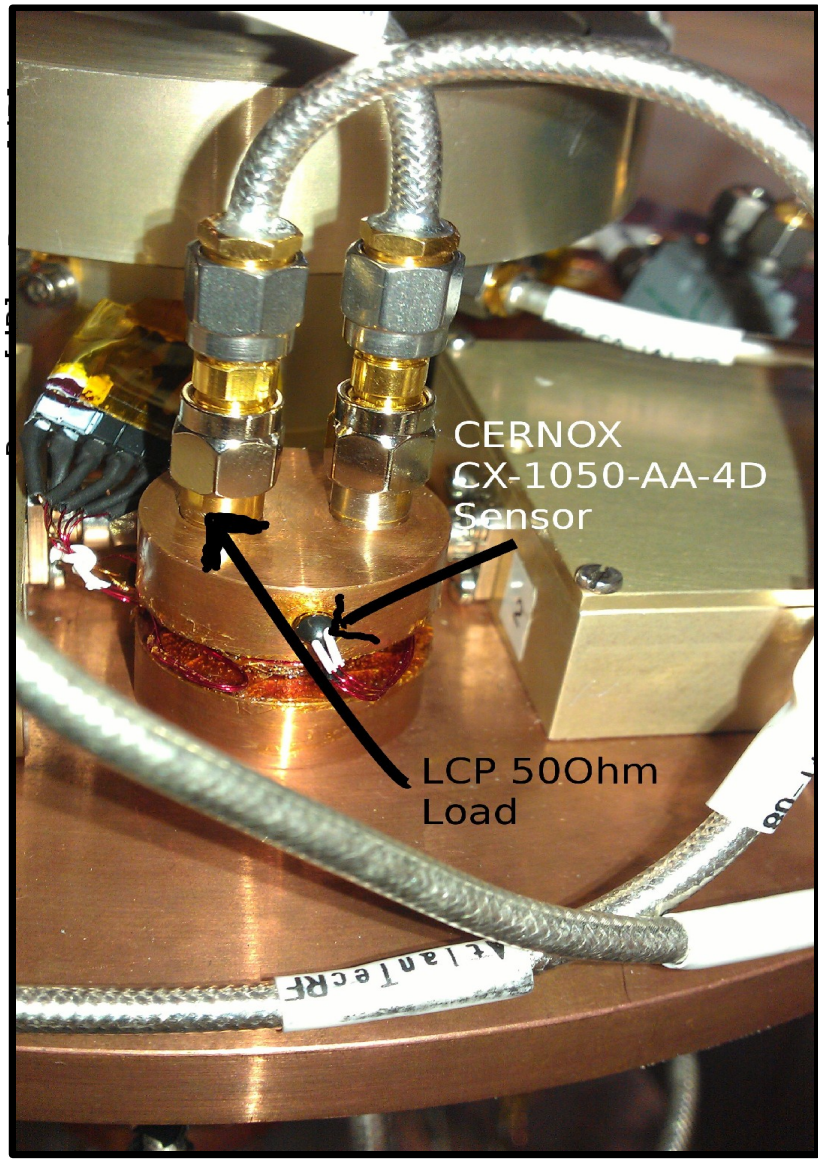
Intensity Data



Intensity Data



Intensity Data



- C-BASS North observing...
- C-BASS South commissioning in Oxford
- ~ May 2012 - ship C-BASS South to SA
- ~ Oct 2012- start CBASS South survey
- ~ Dec 2012 - end of C-BASS North

- ~ Apr 2013- 1st northern survey papers
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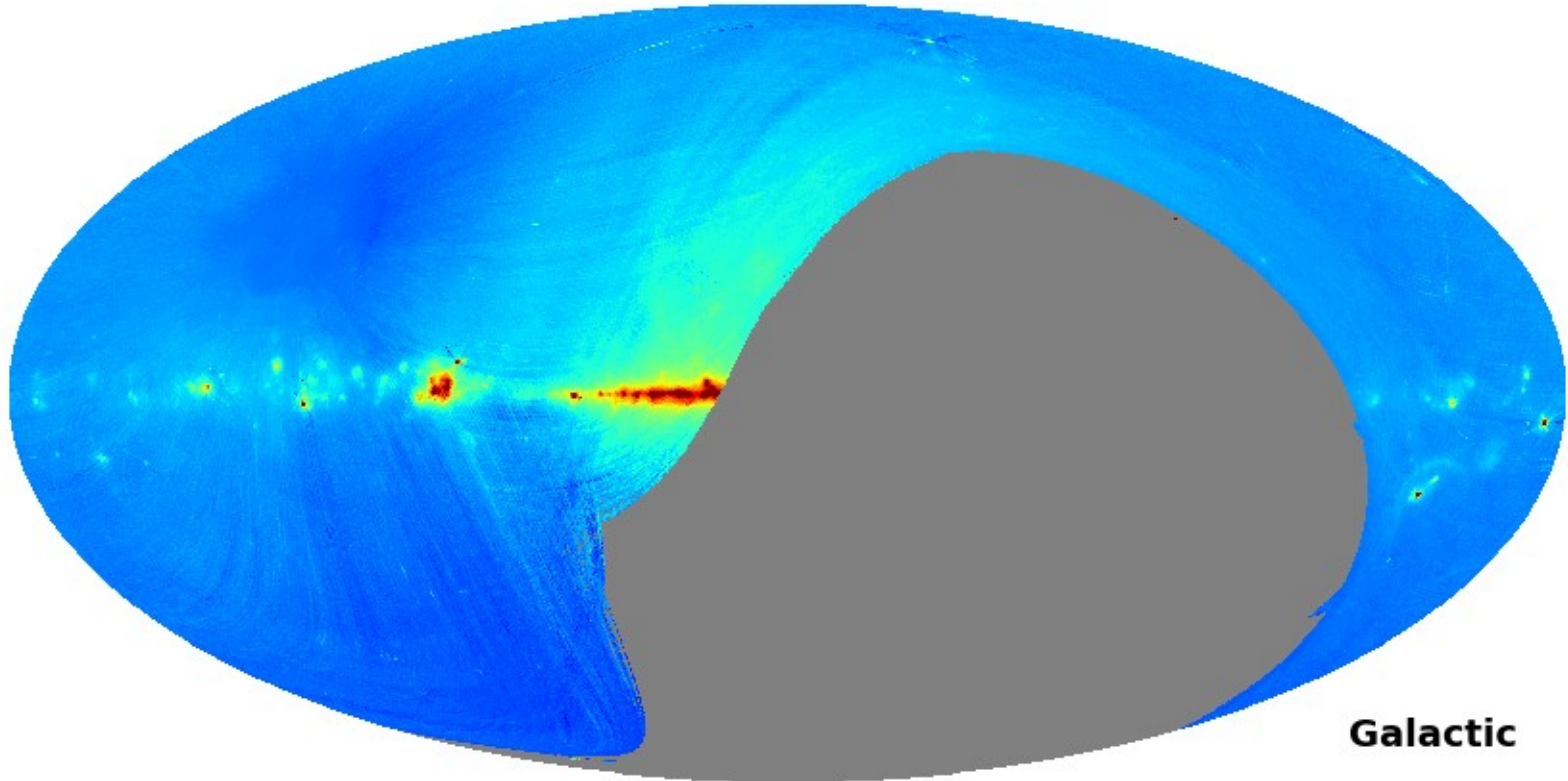
- ~ Apr 2014- 1st full survey papers
- ~ Oct 2014- plan for first data release

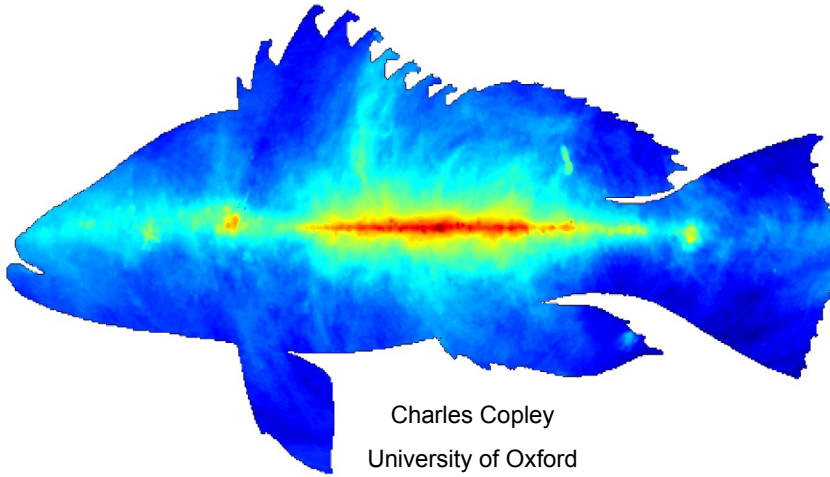
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C-BASS South in Oxford

Mollweide view





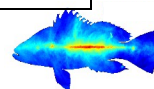
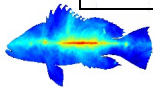


Charles Copley
University of Oxford

CALTECH



Sky-coverage	All-sky
Angular resolution	0.73 deg (43.8 arcmin)
Sensitivity	< 0.1mK r.m.s
Stokes coverage	I, Q, U, (V)
Tsys	~20K, including sky
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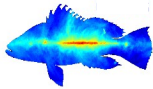


Primary aims:

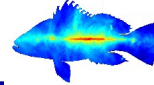
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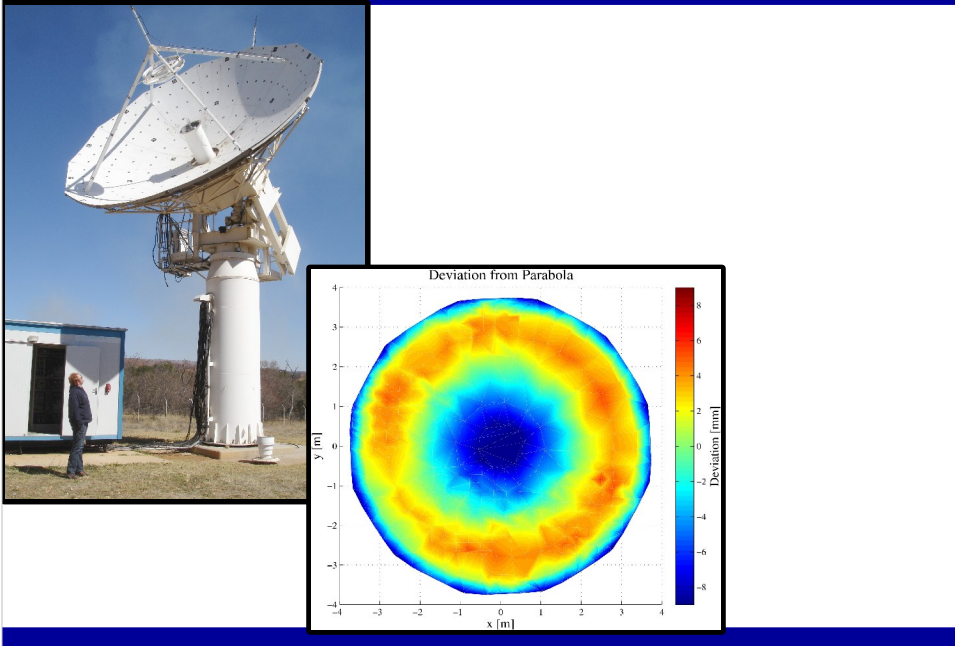


....to name but a few

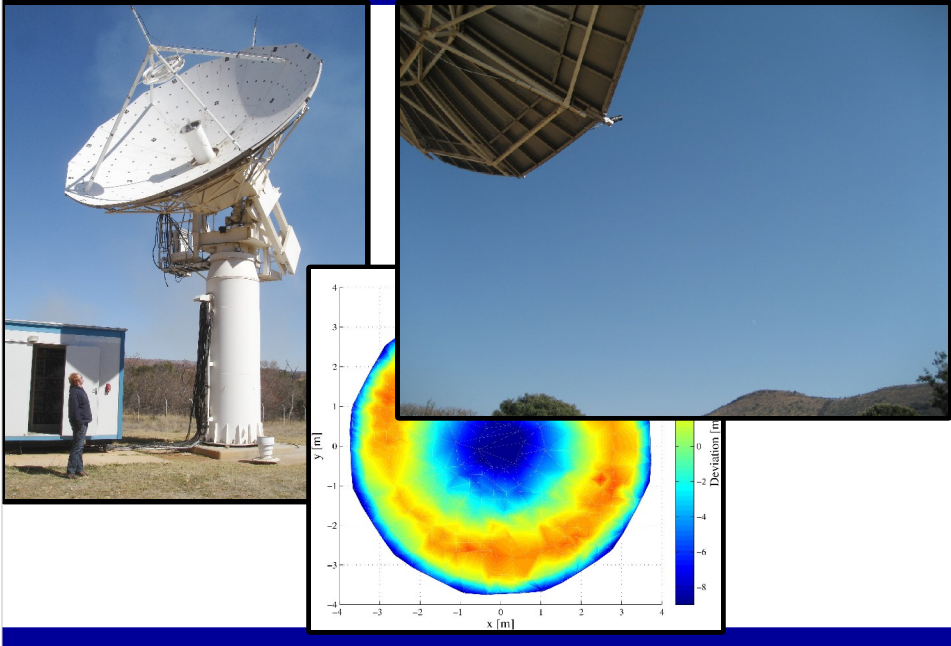




Downconverts -- ROACH exactly same functionality of analogue - I Q U V as before. Can synthesise exact band of Northern telescope. RFI easier.



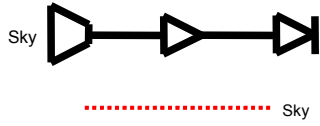
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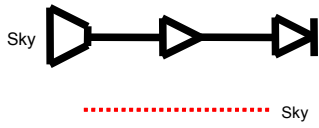
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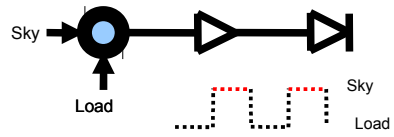
Total Power Radiometer



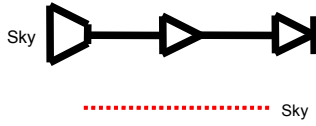
Total Power Radiometer



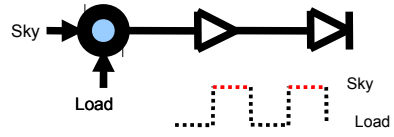
Dicke Switching



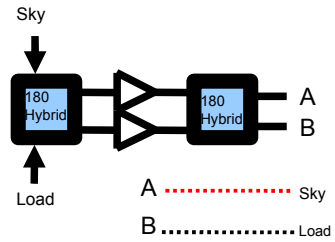
Total Power Radiometer



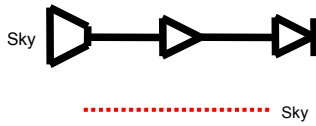
Dicke Switching



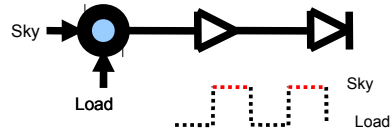
Continuous Comparison



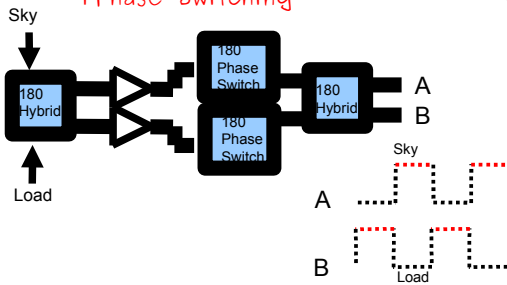
Total Power Radiometer



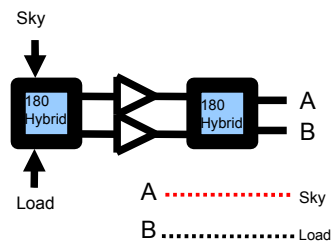
Dicke Switching

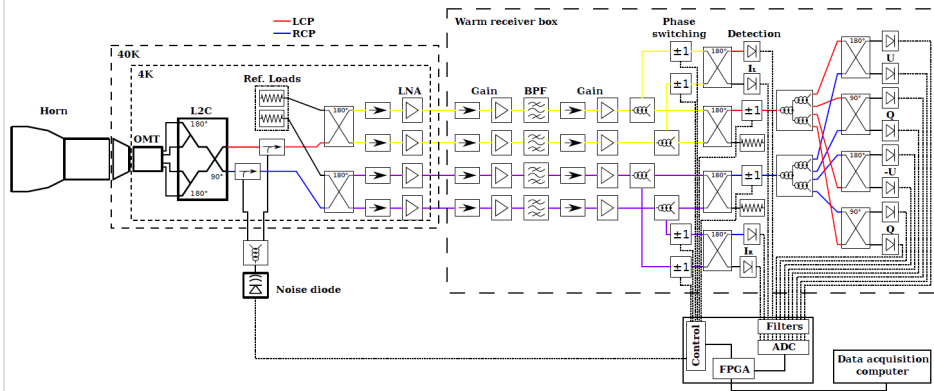


+Phase Switching

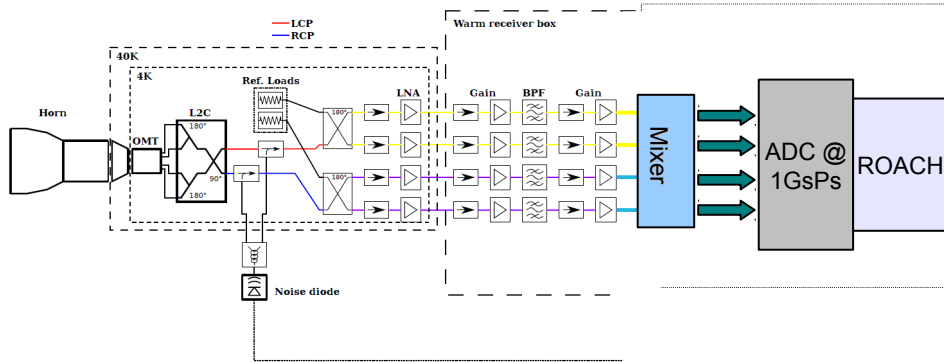


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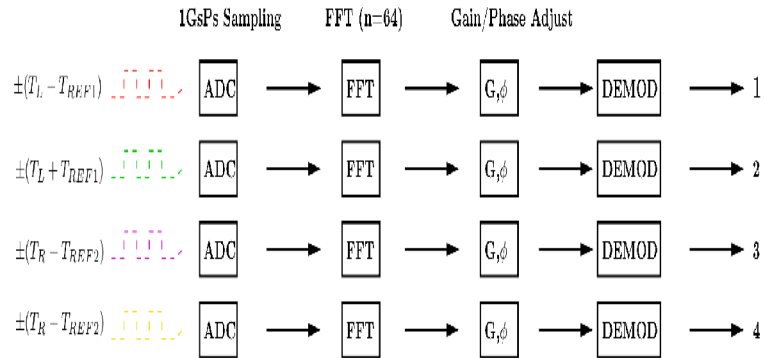


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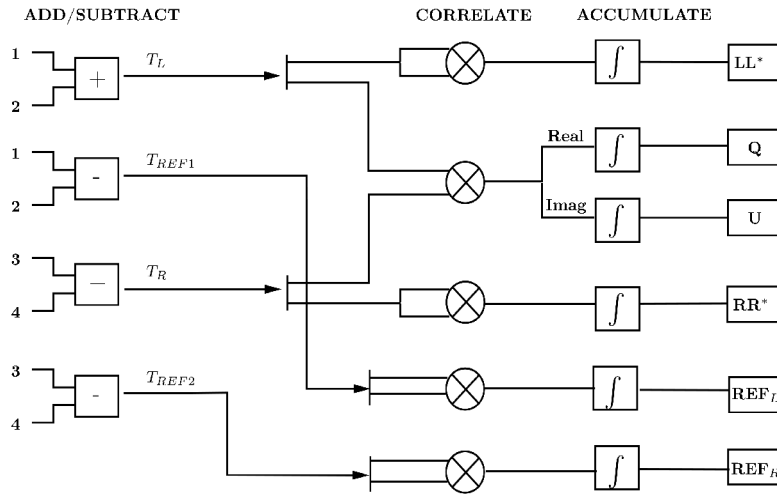


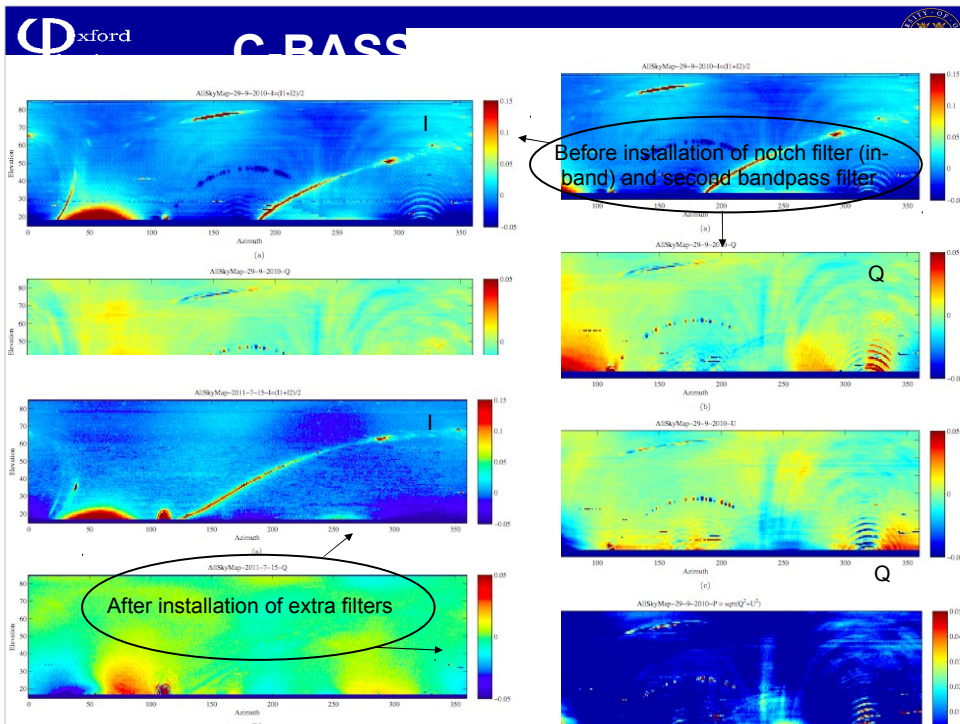
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SIGNAL PRE-CONDITIONING (PER 500MHz BAND)



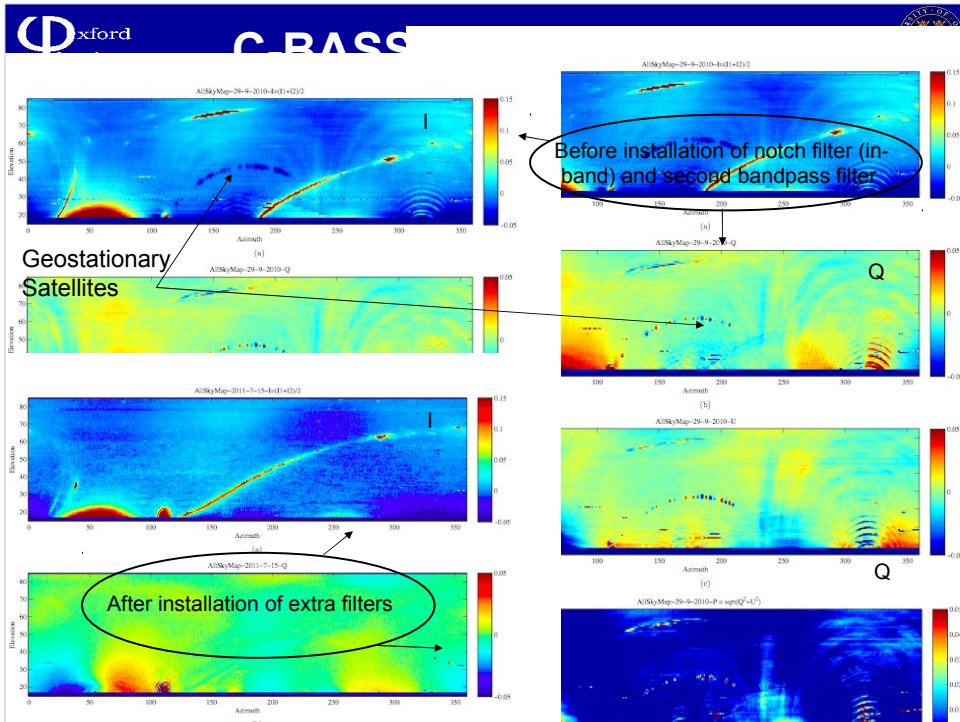
DIGITAL POLARIMETER (PER 500 MHZ BAND)





Notch filters - 300MHZ total

Bandpass -60dB rejection out of band. In band Rfi is point-to-point microwave transmitters in the valley. Worst out of band rfi was geostatory satellites.

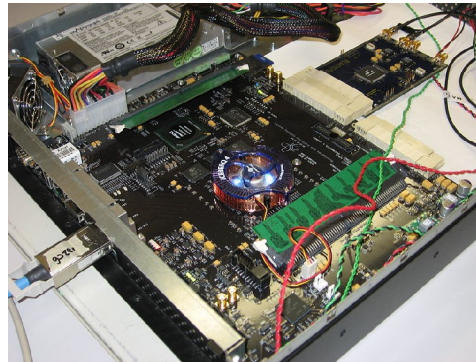


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Community Base

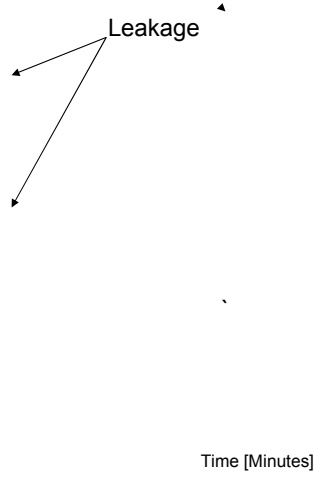
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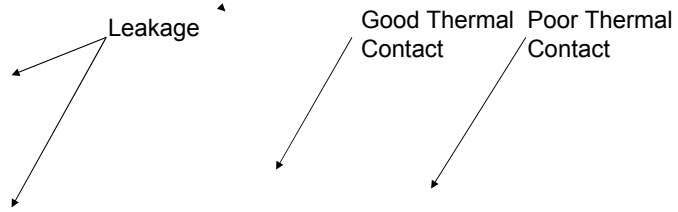
ROACH
RECONFIGURABLE OPEN ARCHITECTURE
COMPUTING HARDWARE



Time [Minutes]

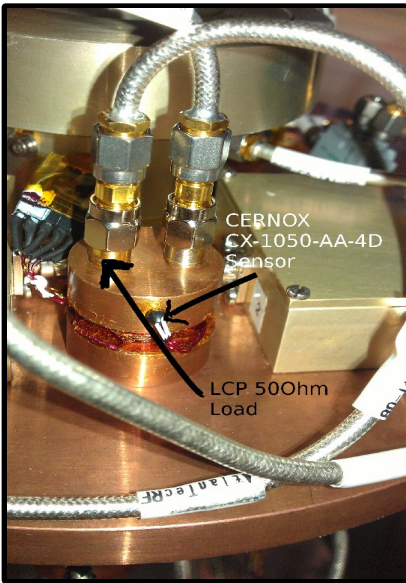


Intensity Data



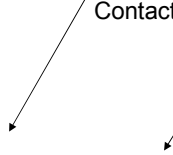
Time [Minutes]

Intensity Data



Good Thermal
Contact

Poor Thermal
Contact



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Mollweide view

