

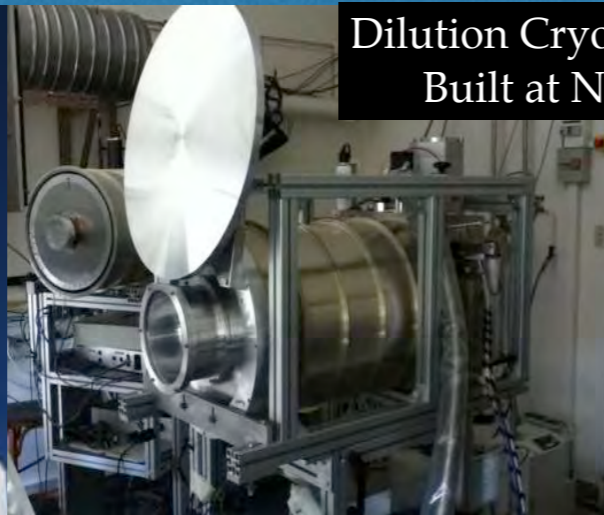
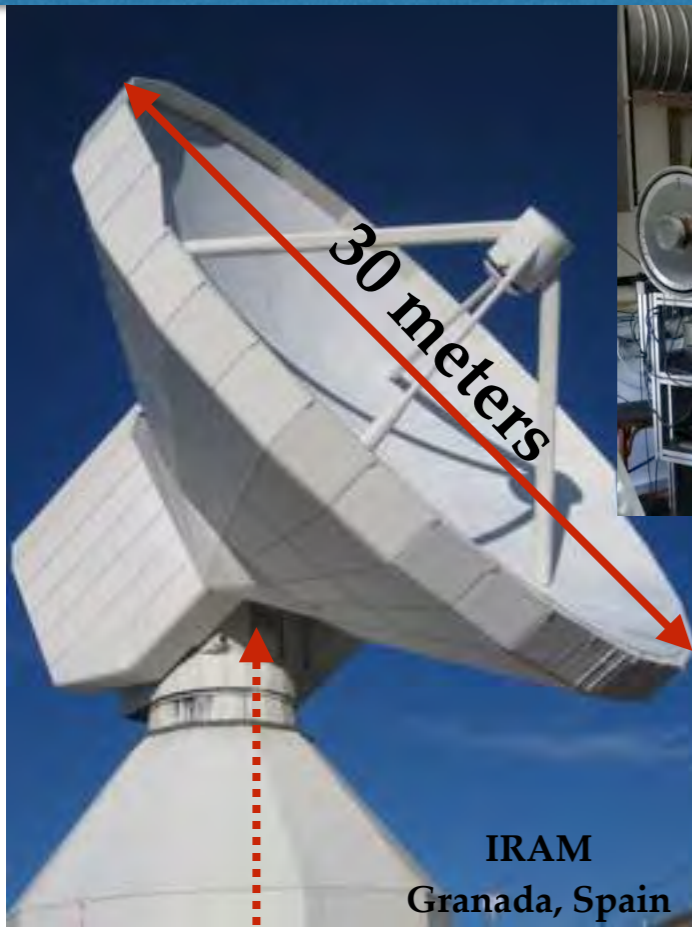
FIRST POLARISED LIGHT WITH NIKA

*Low Temperature Detectors
July, 2015*

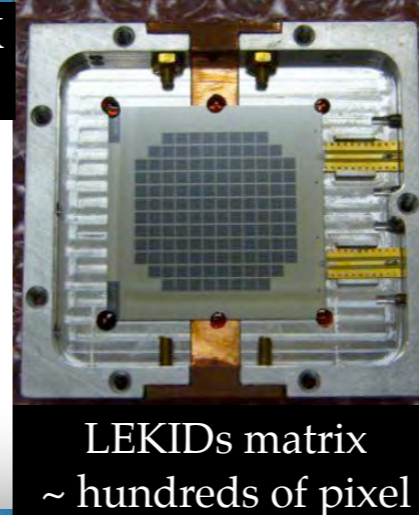
Outline

- Overview NIKA instrument
- Data analysis pipeline
- Preliminary results
- Conclusions & Perspectives

Overview NIKA instrument



Dilution Cryostat ≈ 100 mK
Built at Néel Institut



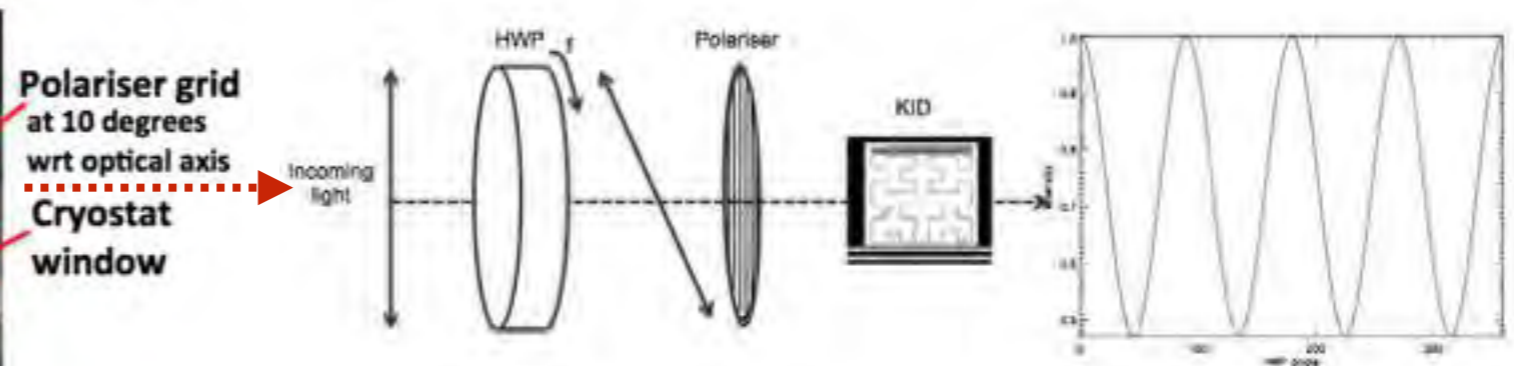
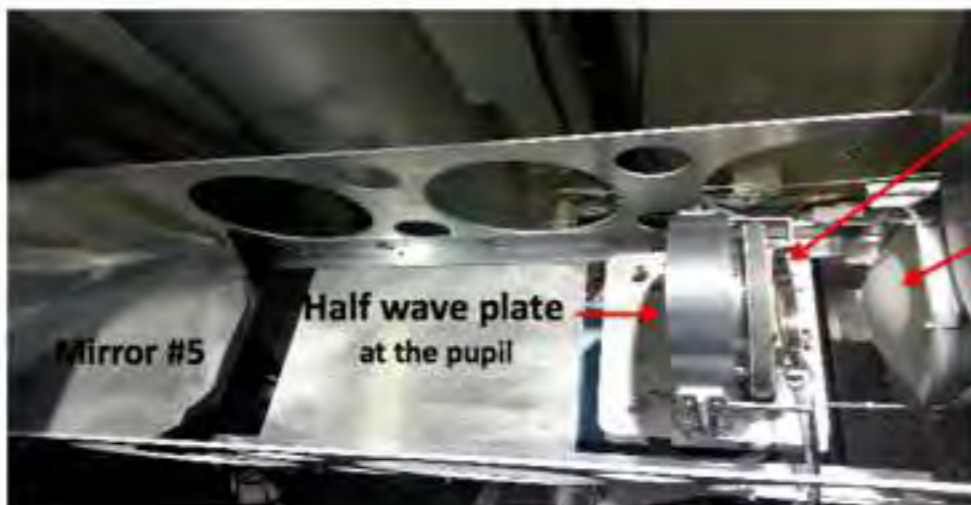
LEKIDs matrix
 \sim hundreds of pixel



Readout electronics

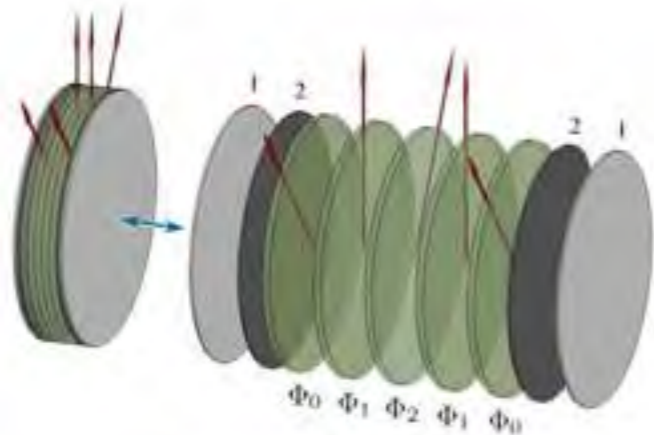
Bands : 1.25 mm & 2.14 mm
 Beam (FWHM) : 12.5'' & 18''
 # Detectors : 224 & 132
 Field of view: 2.2 arc-minutes
 Sensitivity : 40 and 14 mJy s^{1/2}

POLARISATION SETUP

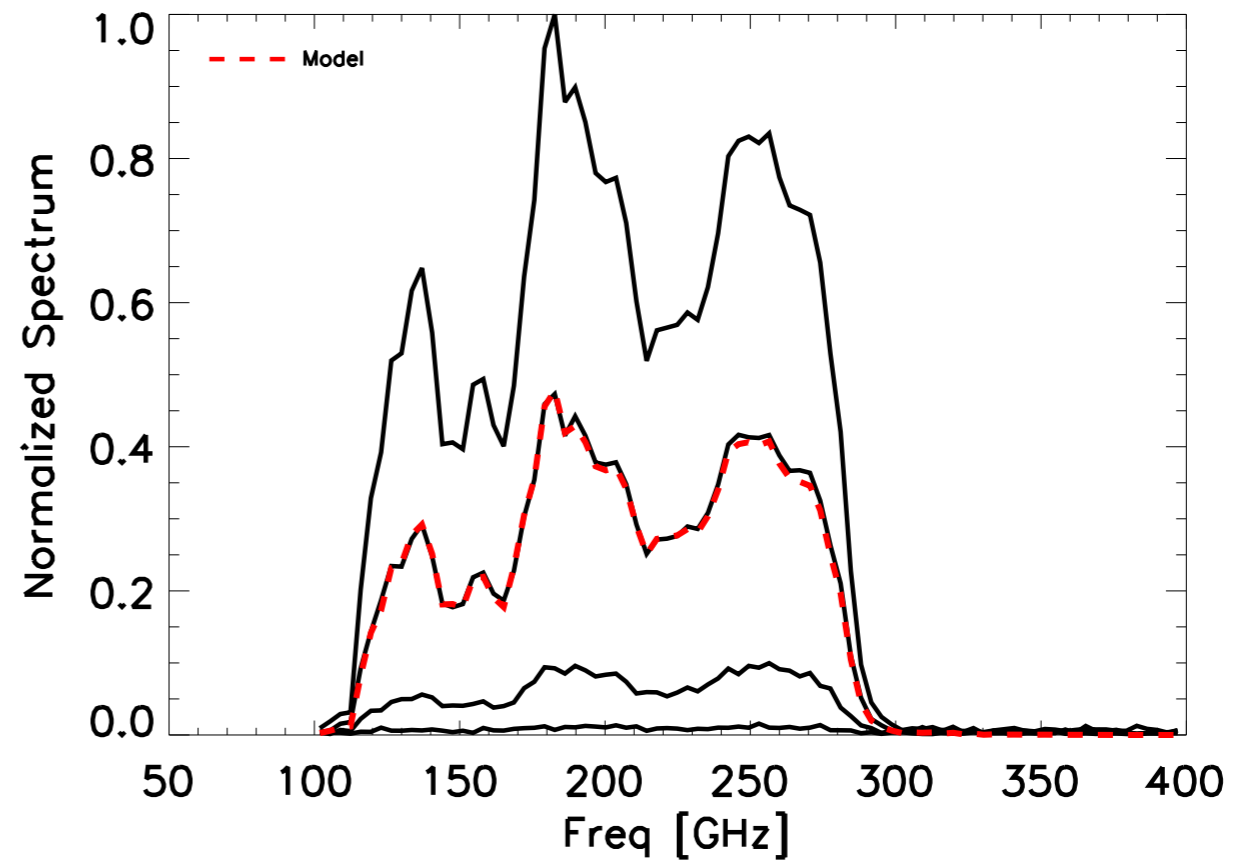


DETECTION STRATEGY: WARM (ROTATING HWP + POLARISER) + LEKIDs
 QUASI-SIMULTANEOUS DETECTION OF I, Q, U

Laboratory characterisation



Multi-layer HWP
Optimised in the NIKA range
frequency

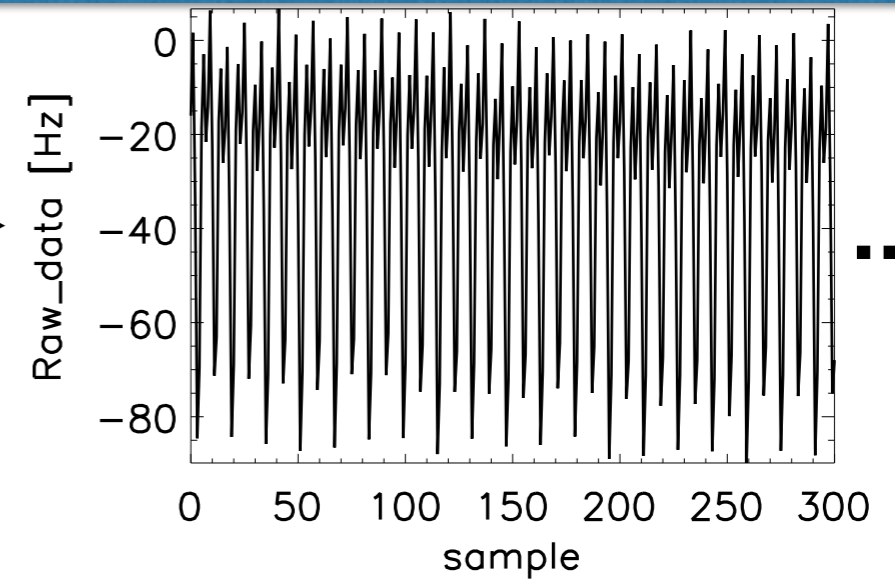
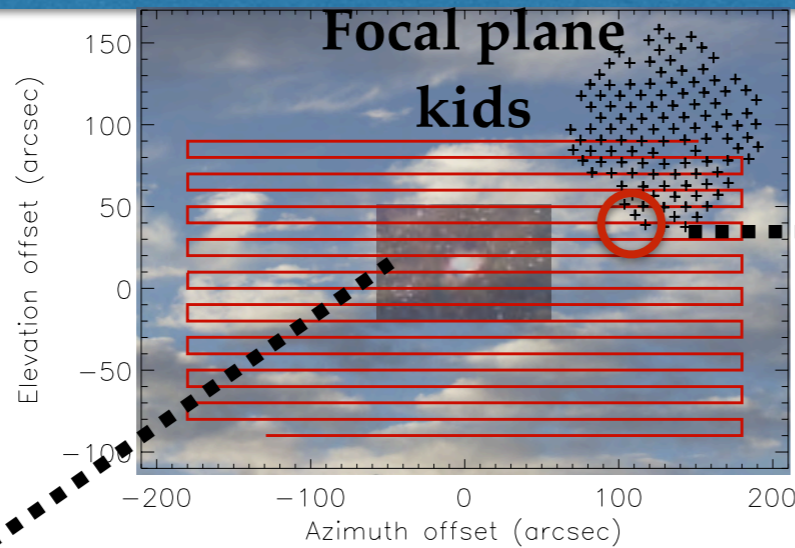


Spectral transmission for different angles of the
HWP with model (red line)

Polarised light transmitted in a large range of frequency

This solution has been chosen for NIKA2

Data analysis pipeline



$$S = \frac{1}{2}(I + Q\cos 4\omega t + U\sin 4\omega t) + \text{noise} + \text{parasite signal at HWP harmonics } (\omega t, 2\omega t, 3\omega t..)$$

Detection of the signal

Subtraction parasite signal

Demodulation method

Noise de-correlation

Projection on the sky

