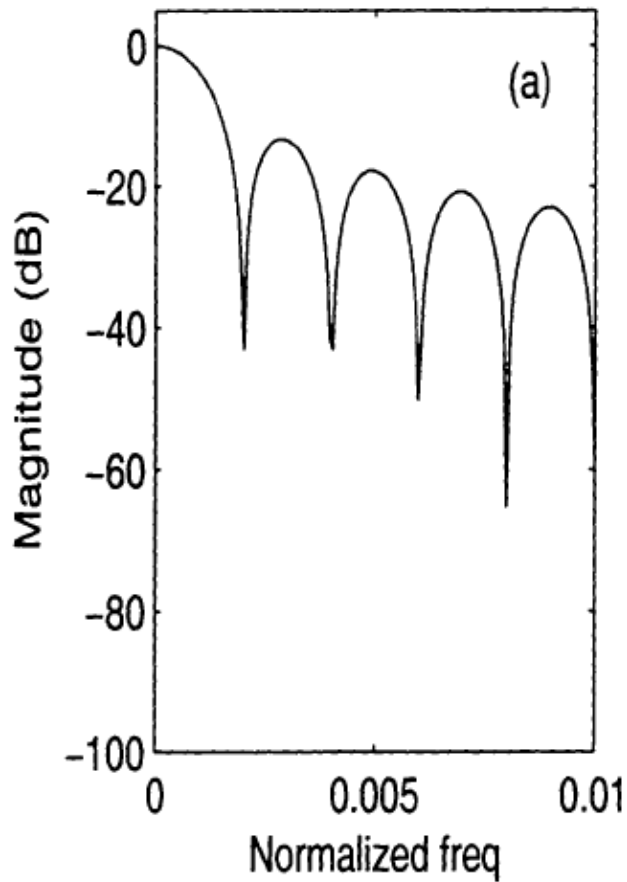
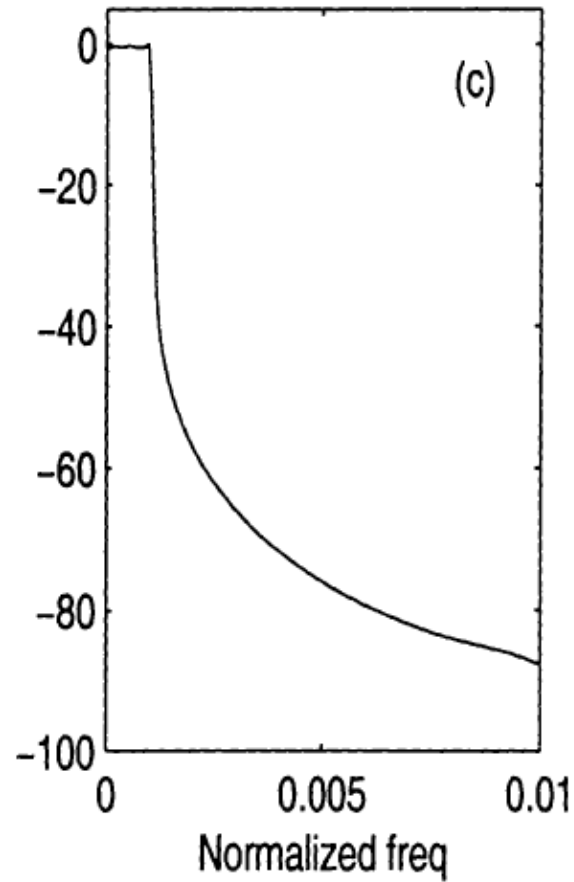


1. Multi-Rate Filtering

Moving-average filter



Multi-rate filter,
resampled with polyphase
filter then elliptic filter



2. Focal-Plane Array

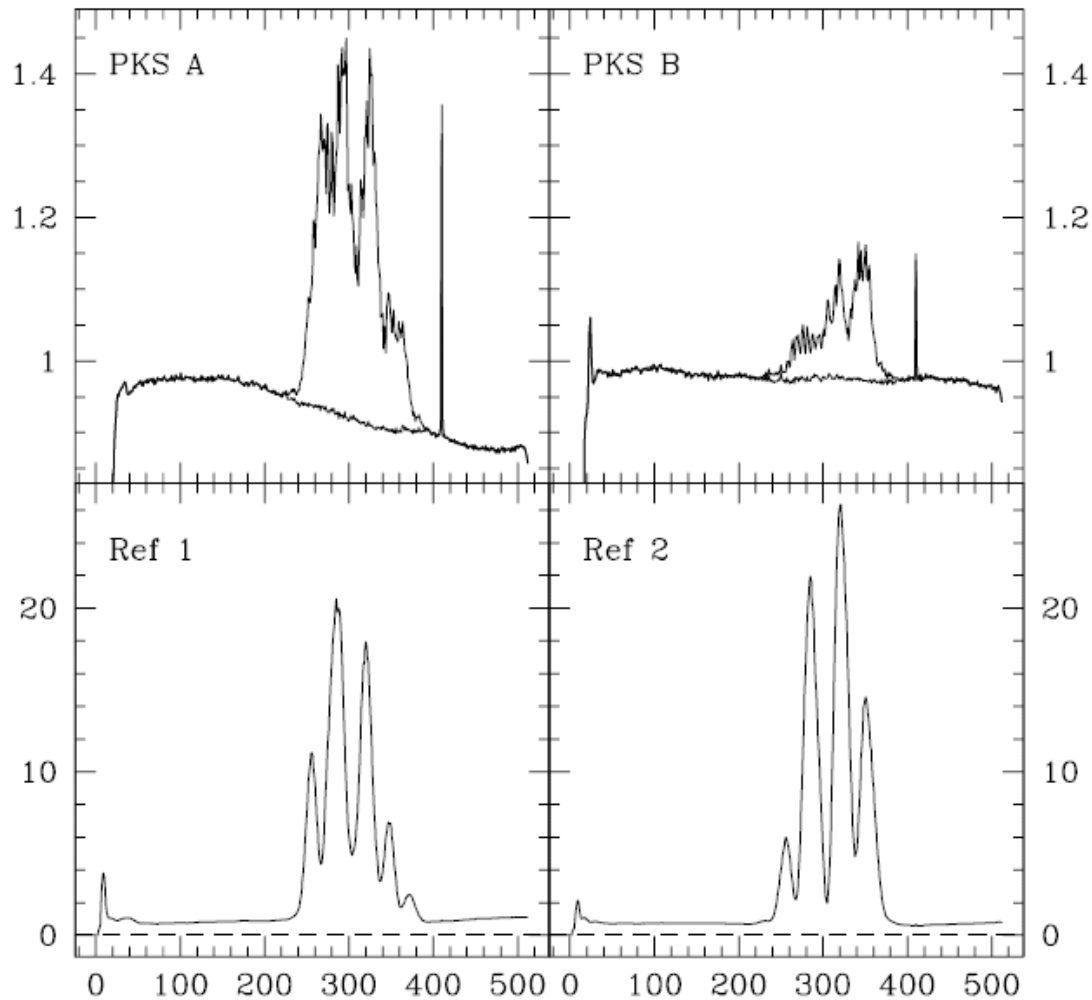
Method:

- Cross correlate between horns in array
- RFI is common to both, astro signal different -> template spectrum of RFI
- Subtract RFI template from astro spectrum

Advantage:

- Good performance
- Subtraction done post-correlation, so one is not committed to correction
- Might correct also baseline ripple

2. Focal-Plane Array

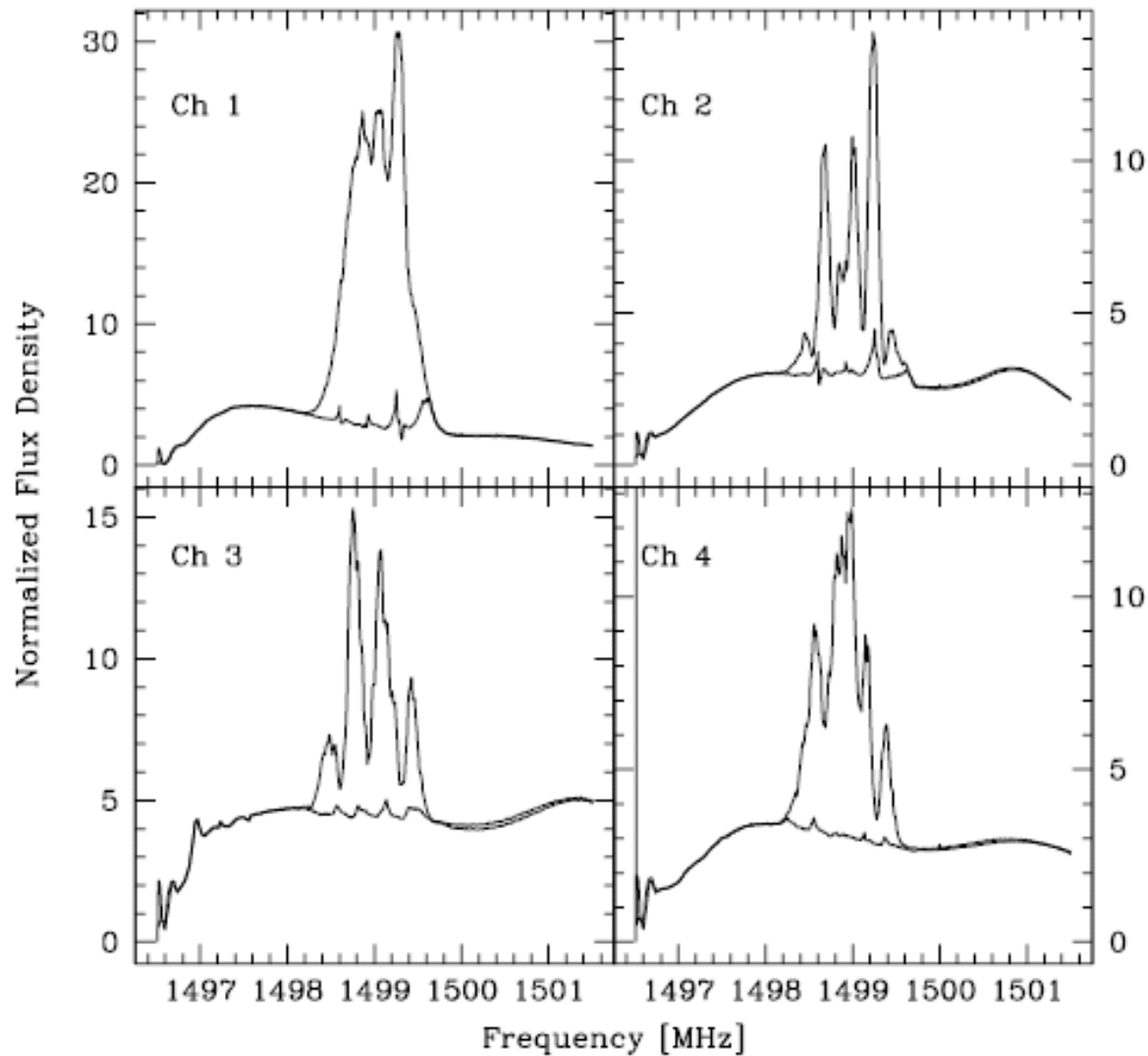


Astronomy horn
Dual polarization

Before & after
subtraction of RFI

Reference horn
Dual polarization
Shows RFI

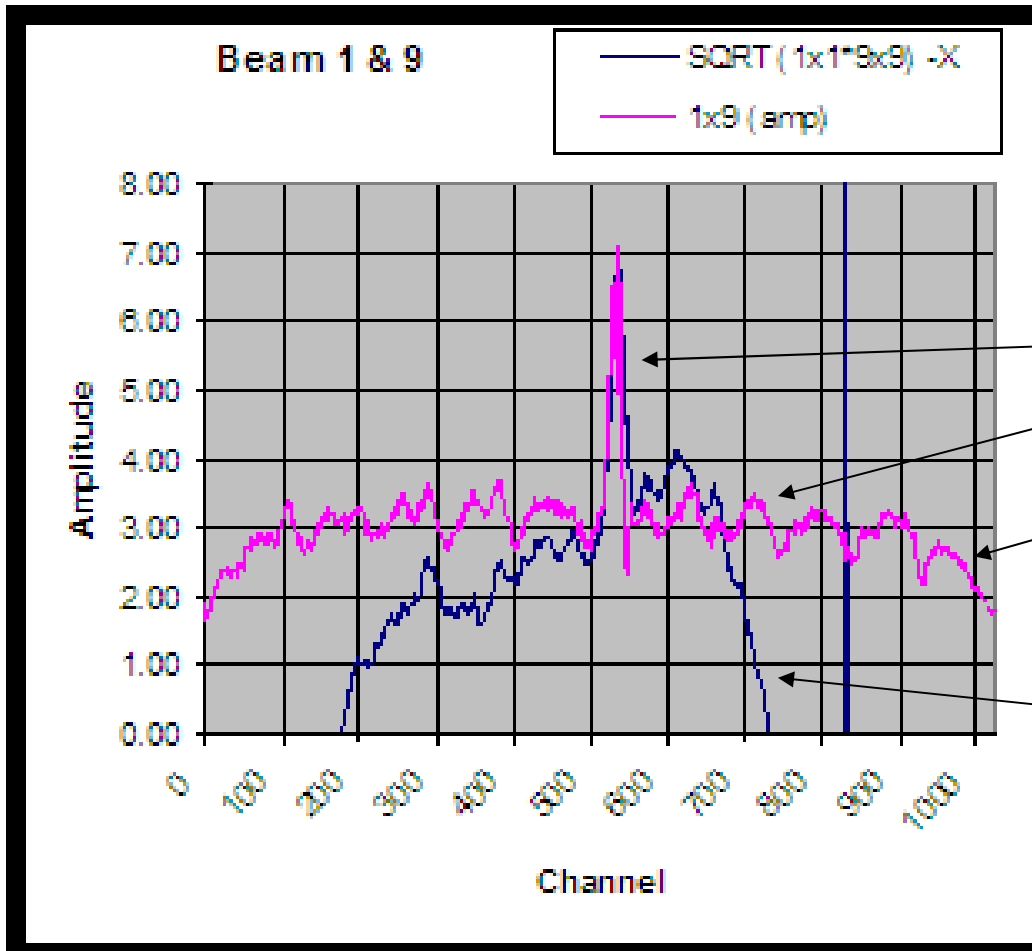
2. Focal-Plane Array



Astronomy horn 1
Dual polarization
Before & after
subtraction of RFI

Astronomy horn 2
Dual polarization
Before & after
subtraction of RFI

2. Focal-Plane Array



Parkes
2 beams, 1 poln

RFI
Standing wave ripple
Cross power beams 1x9

Total power 1x1 + 9x9

Perhaps reduce spectral baseline ripple using cross correlation?

Ekers (2007)

Milestones

Multi-Rate Filter in DiFX

Multi-rate filter design

month man-months

1 1

Test filter on simulated data

2 1

Software module implementing multi-rate filtering for DiFX

3 1

Test filter on real data

4 1

Documentation for multi-rate filter software

5 1

Focal plane array

Acquire test data and correlate

6 1

Software to apply Briggs, Bell & Kesteven (2000) algorithm

7 1

Research on baseline ripple reduction

10 3+

Documentation of software and performance

12 2

Some Issues

OK to bring in focal-plane array?

Platform for focal-plane array algorithm: ParselTongue? CASA?

Lead user: Effelsberg HI survey? APERTIF data?

Drop pieflag?

3. Port pieflag to ParseITongue

- Interoperability:

Write ParseITongue script for AIPS but with data access layer confined to few subroutines to be adapted for working with CASA

Prepare flag table in AIPS for transfer to CASA

(but time-scale mismatch with interoperability? -> can't transfer tables early in project?)

- Overlap with CASA / Oxford / Cambridge / UMAN:

Cambridge (data excision): plans unclear

Oxford (data visualization):

Lead user with RFI-contaminated data

Could provide source-subtracted uv data for RFI mitigation

RFI mitigation could return FG table and statistics (median, rms vs time)

UMAN: ?

CASA: Re-use ALMA heuristics python code?

If ALMA heuristics code already does everything, then:

- do we do nothing and rely on interoperability WP?
- or do we port ALMA heuristics to ParseITongue?

Reuse WSRT flagger in AIPS++? (does similar for WSRT measurement sets)