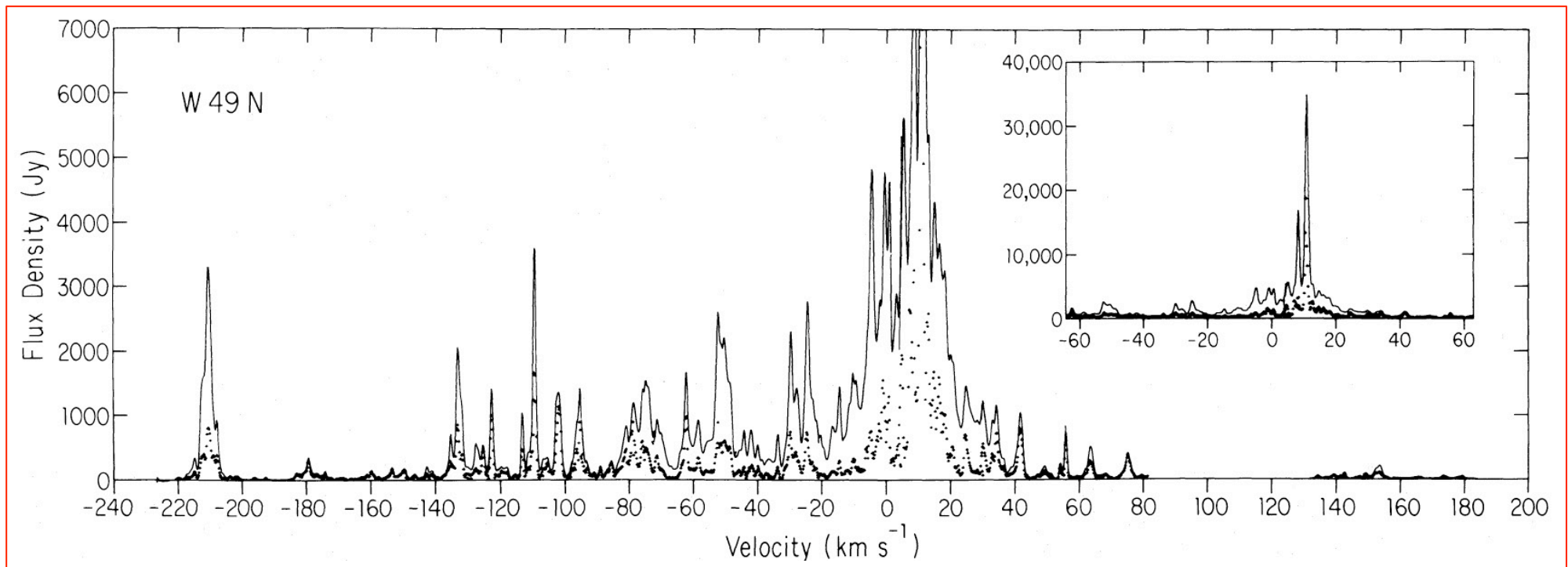


How to identify interference and find weak interference buried in the noise ?

Fig. 1. Examples of *RFI* waveforms in the receiver output versus time: a) and b) impulse-like *RFI*; c) radar impulses; d) narrow-band *RFI*.



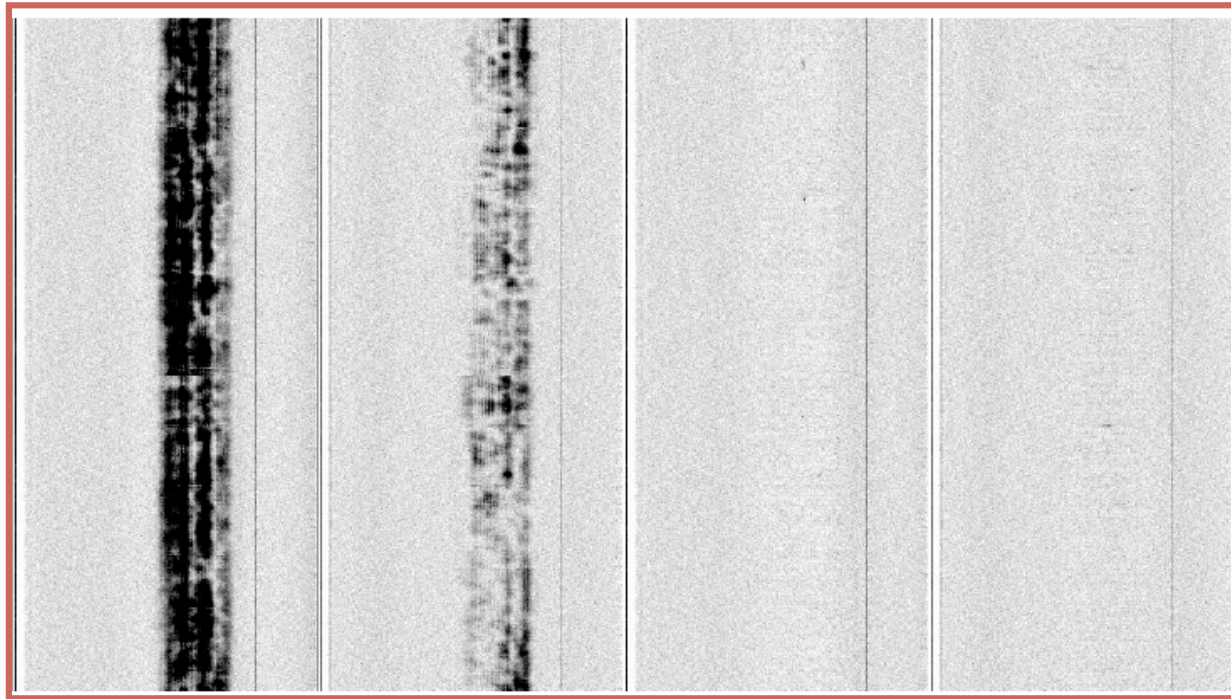
Is there RFI in complicated spectra like this ?

Recognize Weak Interference

- RFI hidden in the noise or maybe variable in time
- bump in spectrum shows up in final (integrated) data only
 - is it is all data ? (display first half and last half of data)
- note that weak astronomical signals are in the noise also !!

Single dish data

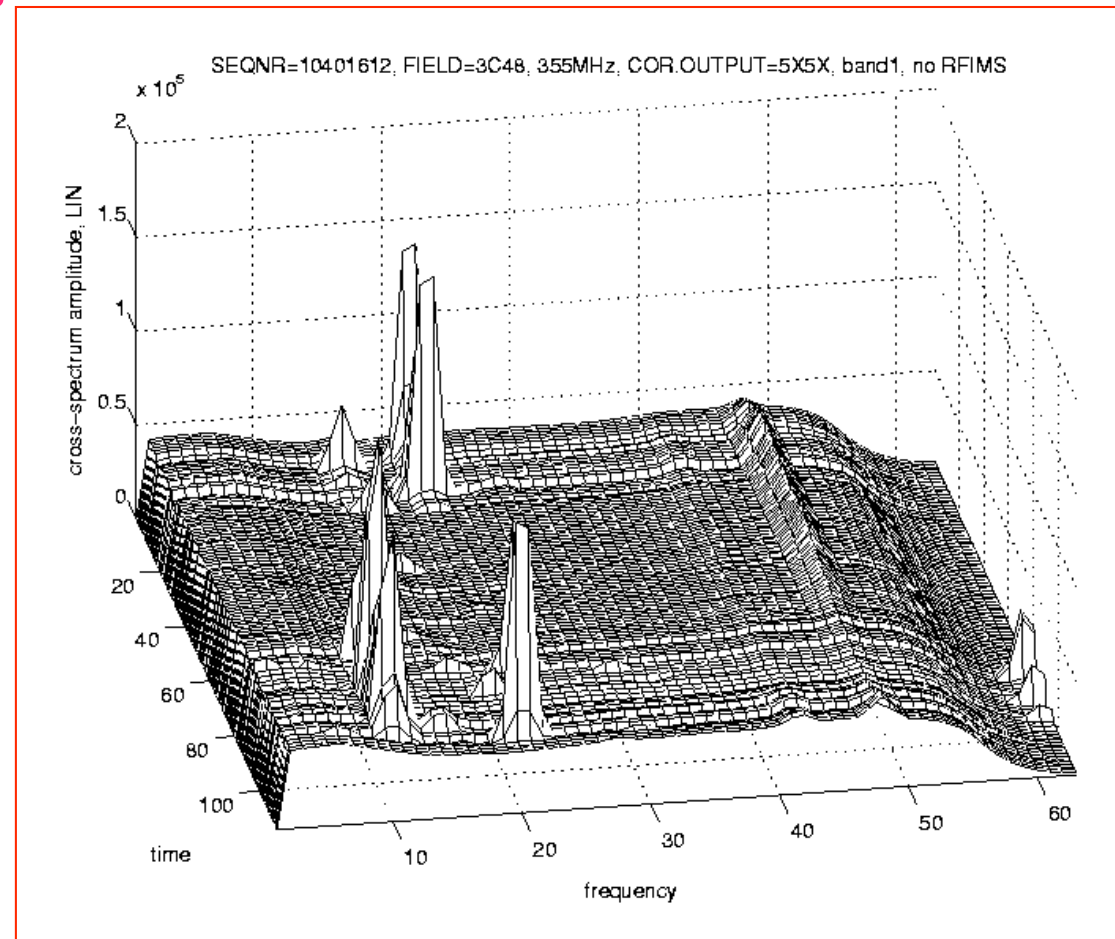
- there is no source direction information
- RFI power is indistinguishable from astronomical power in single-dish
- is there time variable RFI ? => make a waterfall plot of all data records
- does feature it shift in frequency ?
 - => man-made signal shifts in frequency due to Earth motion relative to celestial signal == do a repeat experiment half year later
- use visualization tools to identify funny signals in data
- if there is no evidence for RFI – then feature may be real !



Waterfall plots of all data records
With and without RFI

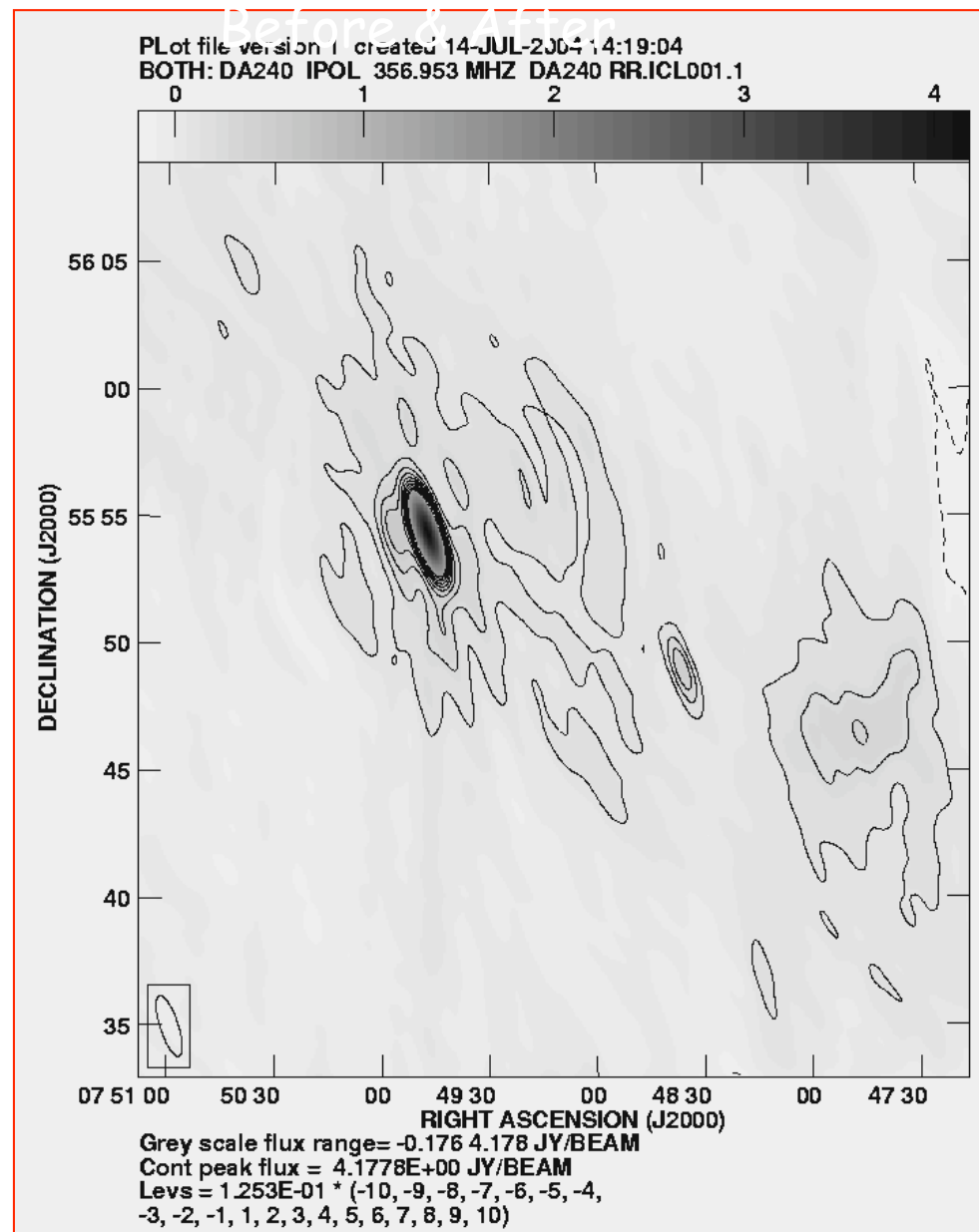
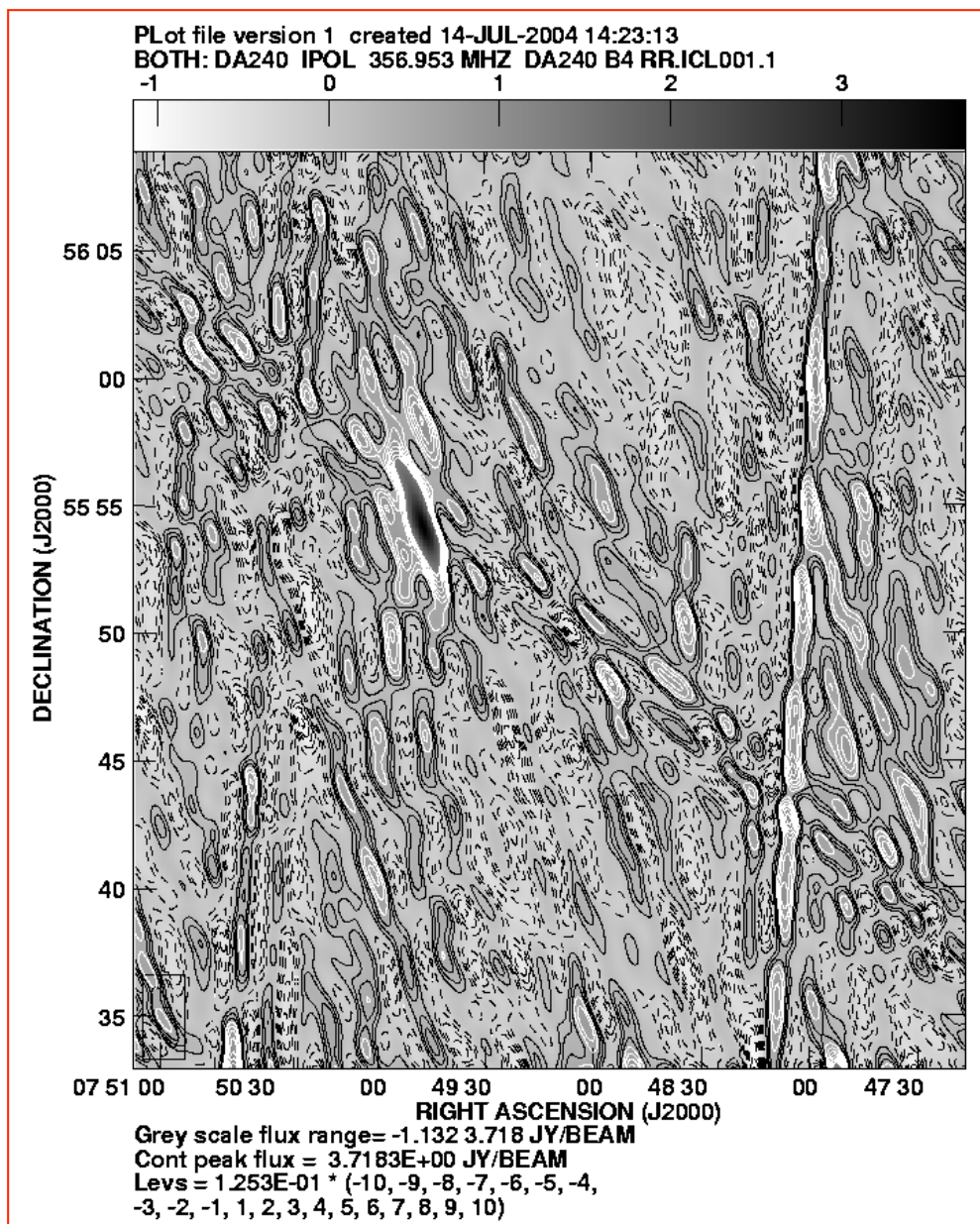
Auto Corr Amplitudes for single antenna

transient RFI stands
out above noise

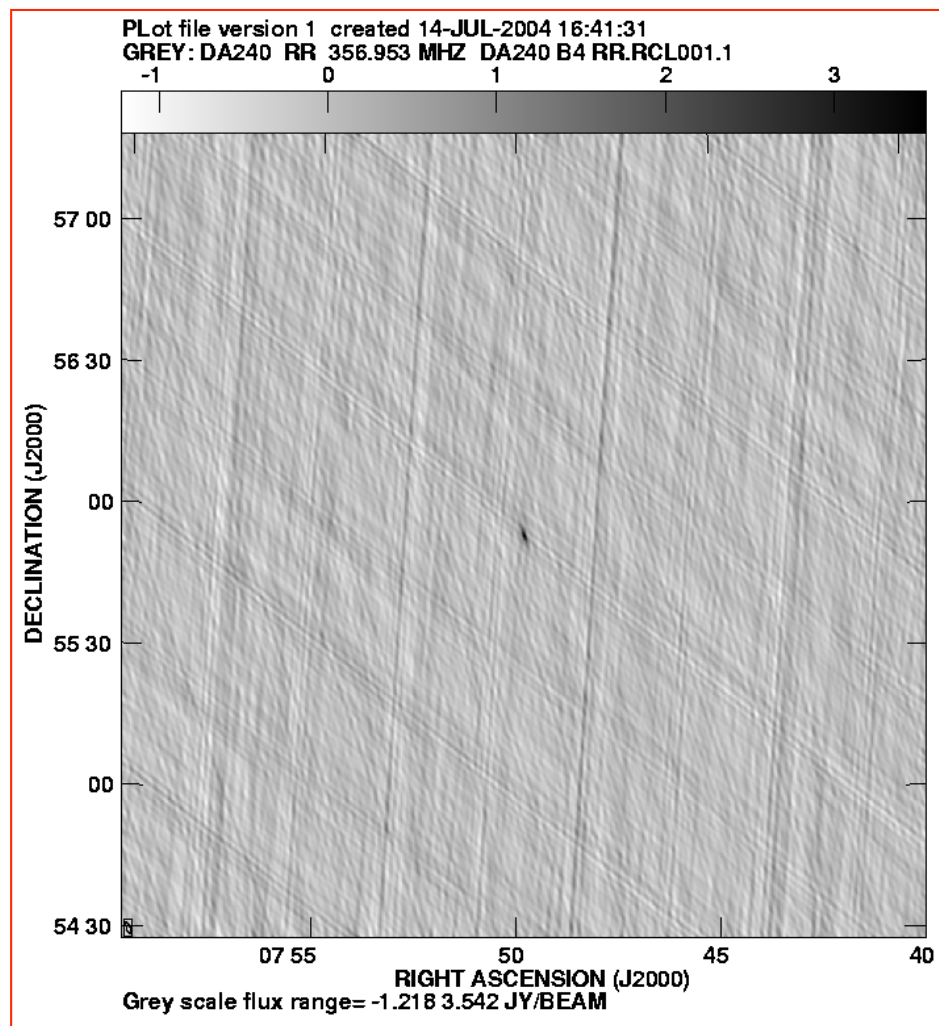


Weak interference in Array Instruments

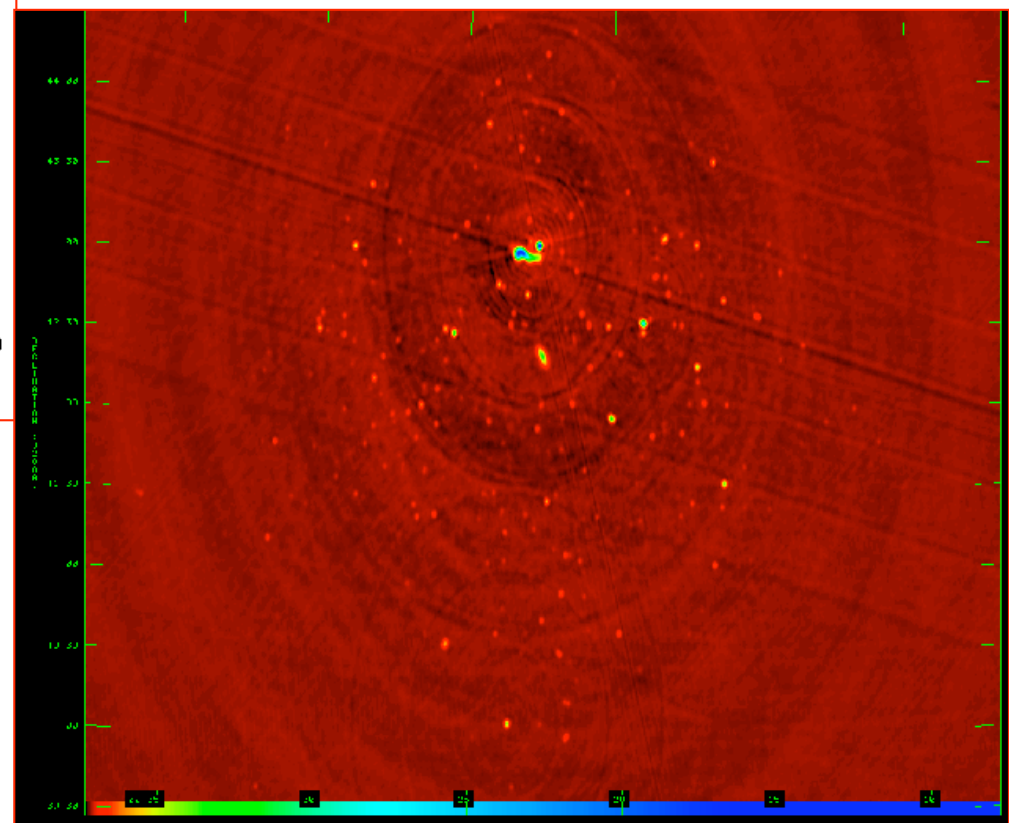
- RFI causes striping in maps
- RFI causes increased rms in the map
- visualization of UV data for each antenna pair
- check amplitudes and phase vs time for each baseline
- auto- correlation and cross-correlation data
- are there any variable signals anywhere ?
- use flagging for anything unusual



Before and after flagging



Striping caused by RFI at different
 directions on the horizon



Cross Corr Amplitudes

strong and weak variable RFI on
a two antenna baseline

