Reducing EVLA Data for CHANGES

Aka. Flagging...

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20.07.2011

Spent last month in Socorro at the NRAO Operations Center, reducing EVLA data for CHANGES.

AOC building in Socorro. Picture by NRAO

Continuum **HA**los of **N**earby **G**alaxies – An **E**VLA **S**urvey

Survey
proposed the observation of 40 galaxies with EVLA. Galaxies are highly inclined to look into their halo and hopefully measure radio flux to observe stuff like CR, Quadrupole Fields, Wind Speeds...

Full Stokes in L Band (20cm) to a sensitivity of a few µJ / Beam

11 galaxies are already observed in B conf.

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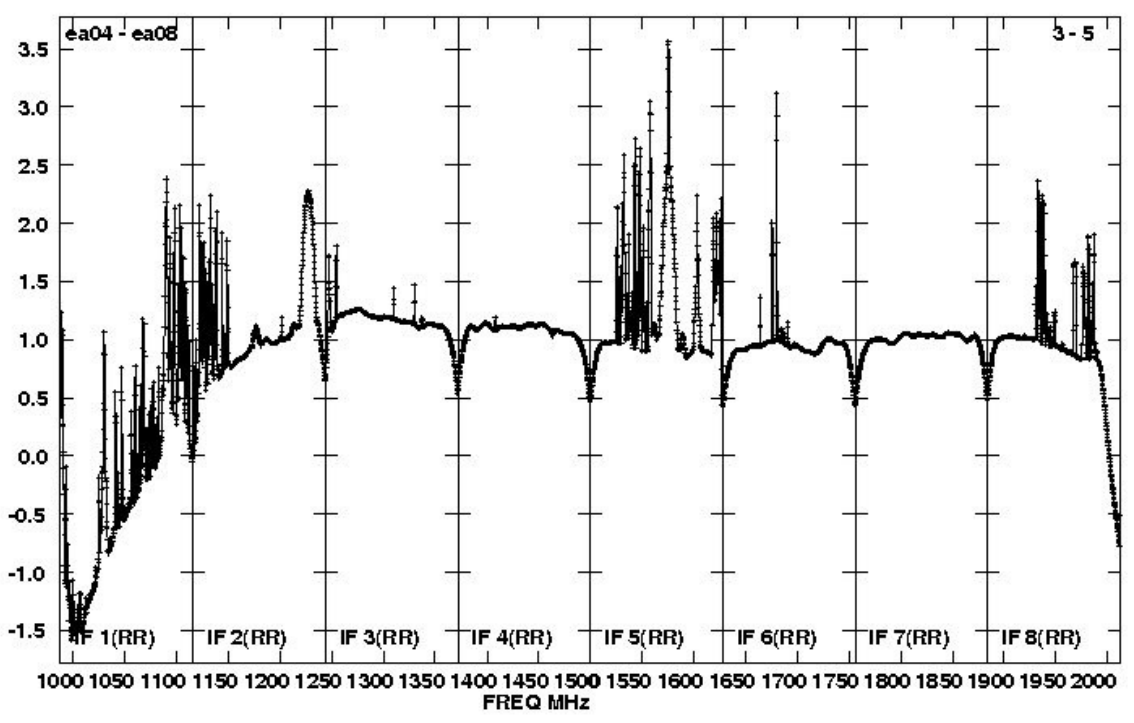
Observational Parameters:

27 Antennas

32 spectral windows, 64 channels

Each channel has a width of 250 KHz → total bandwidth of 512 MHz

At ~1.5 Ghz, there was a gap in the observed frequency due to high RFI contamination



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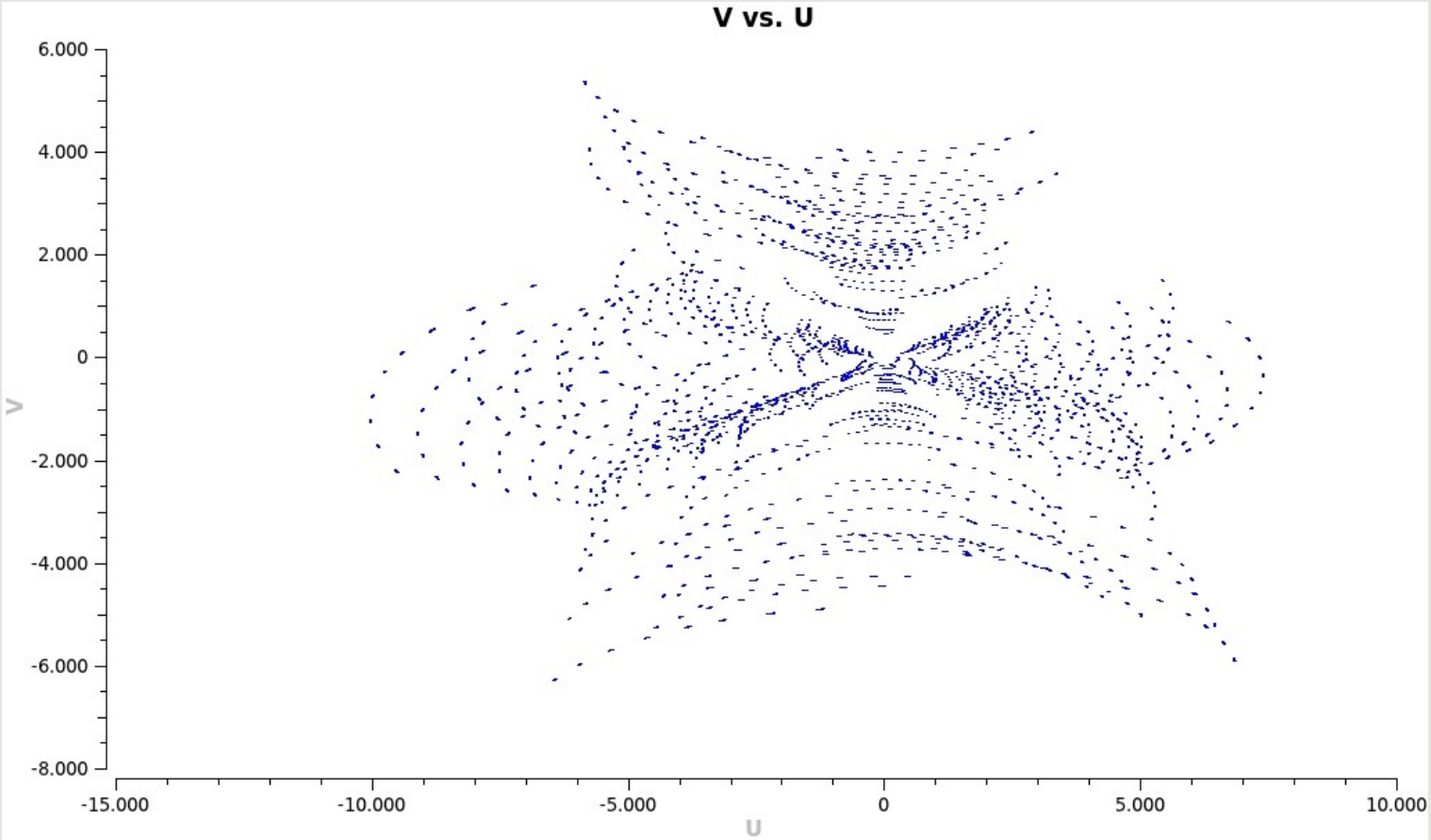
27 Antennas in B configuration have good uv coverage: Phasecalibrator



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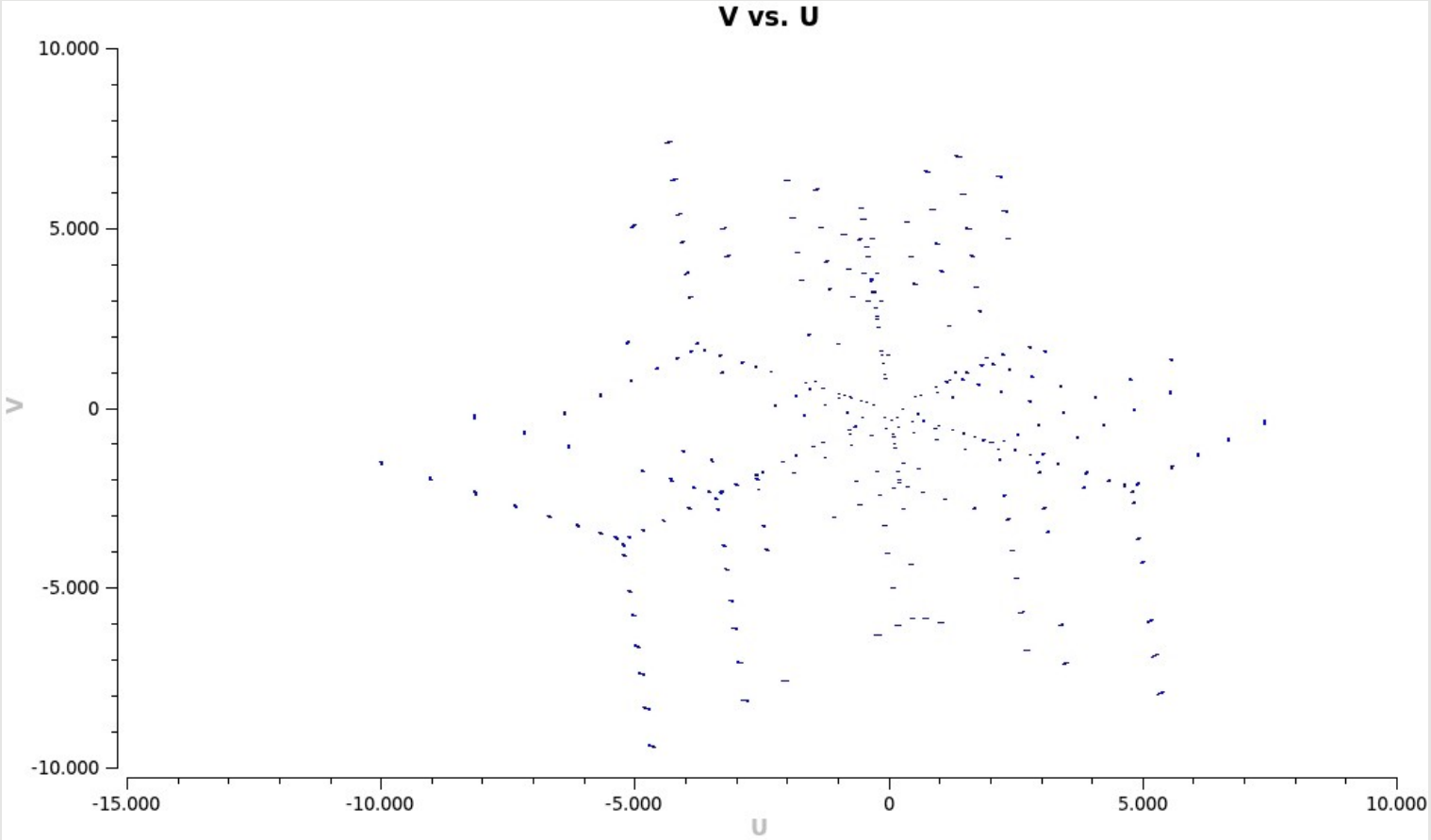
27 Antennas in B configuration have good uv coverage: Primary Calibrator



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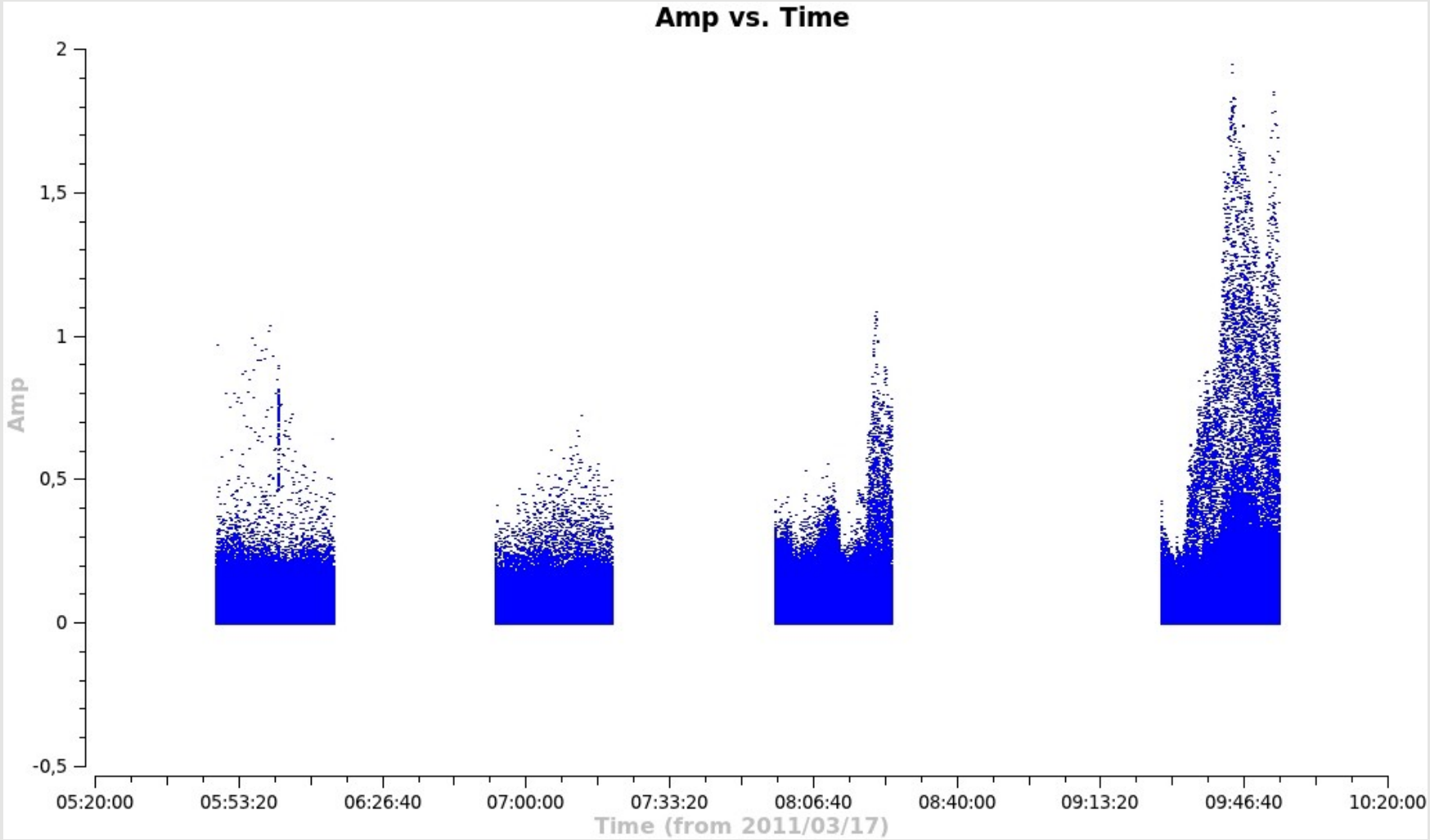
Flagging took 3.5 weeks, baseline for baseline, spw for spw, eye for eye...



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New approach through rficonsole.

First of all: Get latest Casa version (3.2.1), older ones have trouble splitting the data.

Works, but needs a lot of trial and error to get good flagging parameters. Still much faster then 3.5 weeks...

Best approach: Preliminery flagging in Casa, then „fineflagging“ in rficonsole.

Casa: Flag „dummy scan“, flag first 10 seconds of each observation „quacking“, flag bad antennas (in my case ea03,ea16,ea17), flag bad time ranges if necessary.

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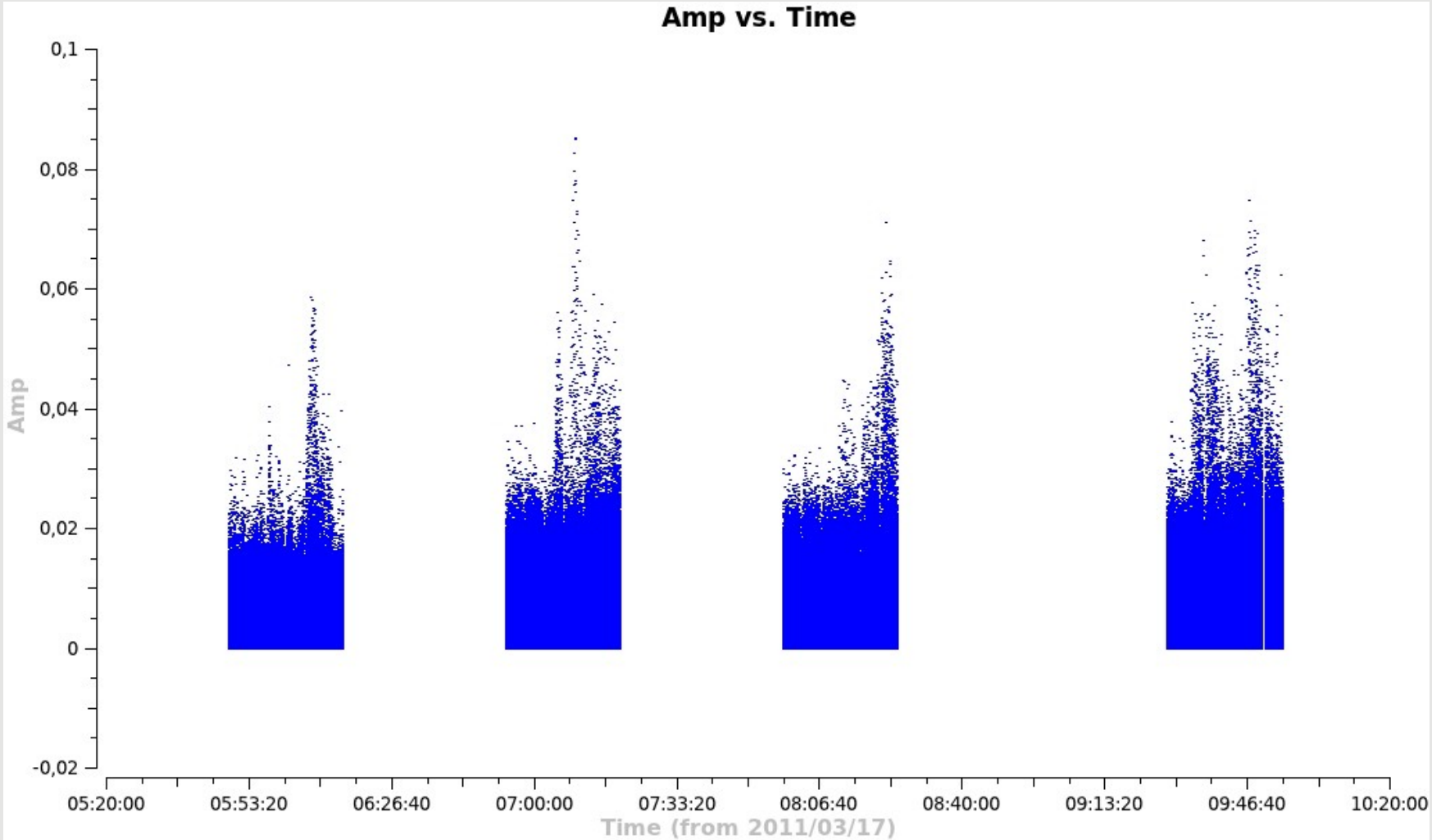
Result looks much better, but can still be flagged further



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Calibration is rather simple, but not that good if one is doing it the regular way.

Main problem is the supplied model for the primary calibrator 3C 286.

Setjy knows the right flux, but for some reason, model has constant flux per spectral window.

Should be smooth.

Solution: Channelbased calibration (remember Björn's talk on it in Pushchino)

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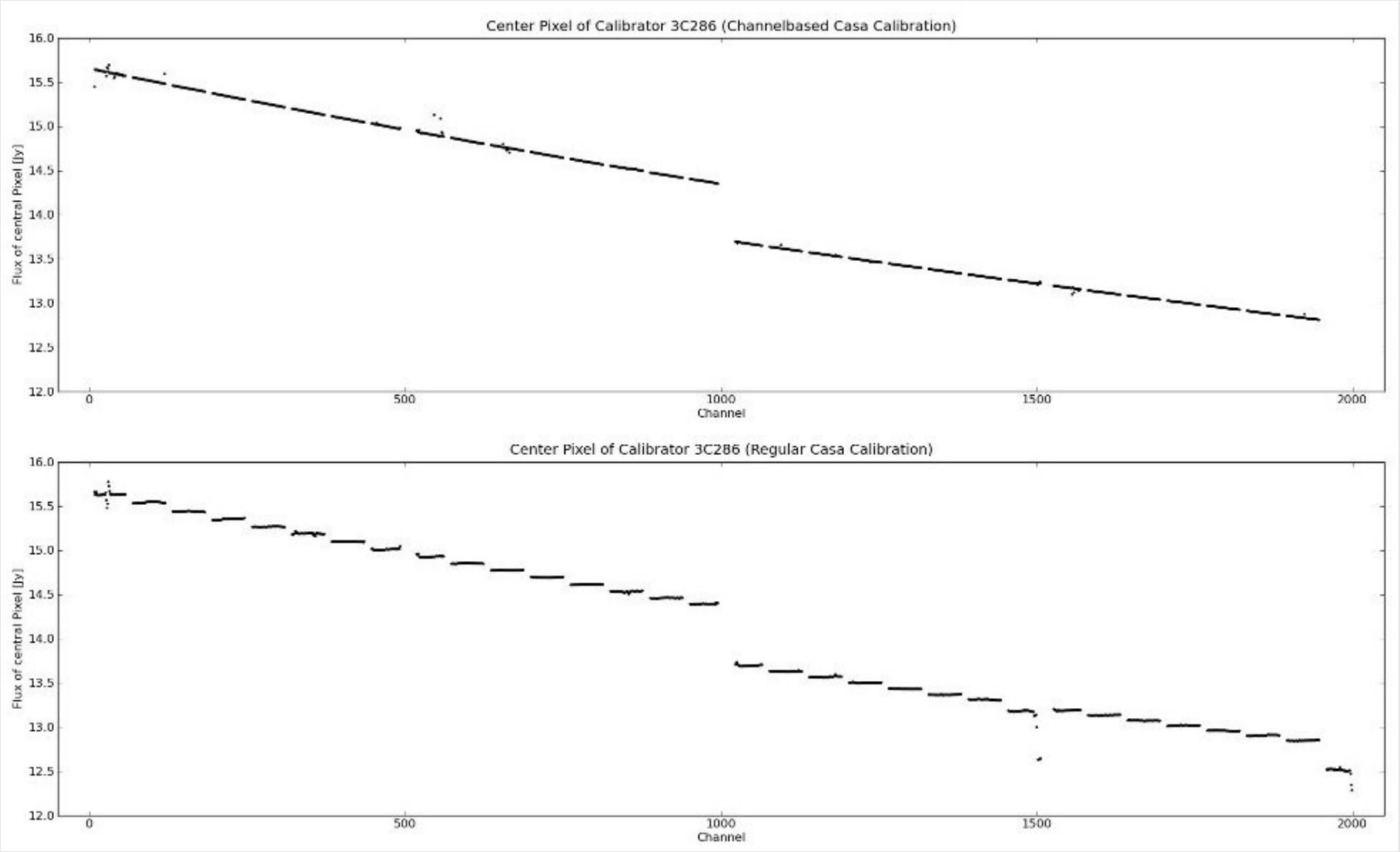

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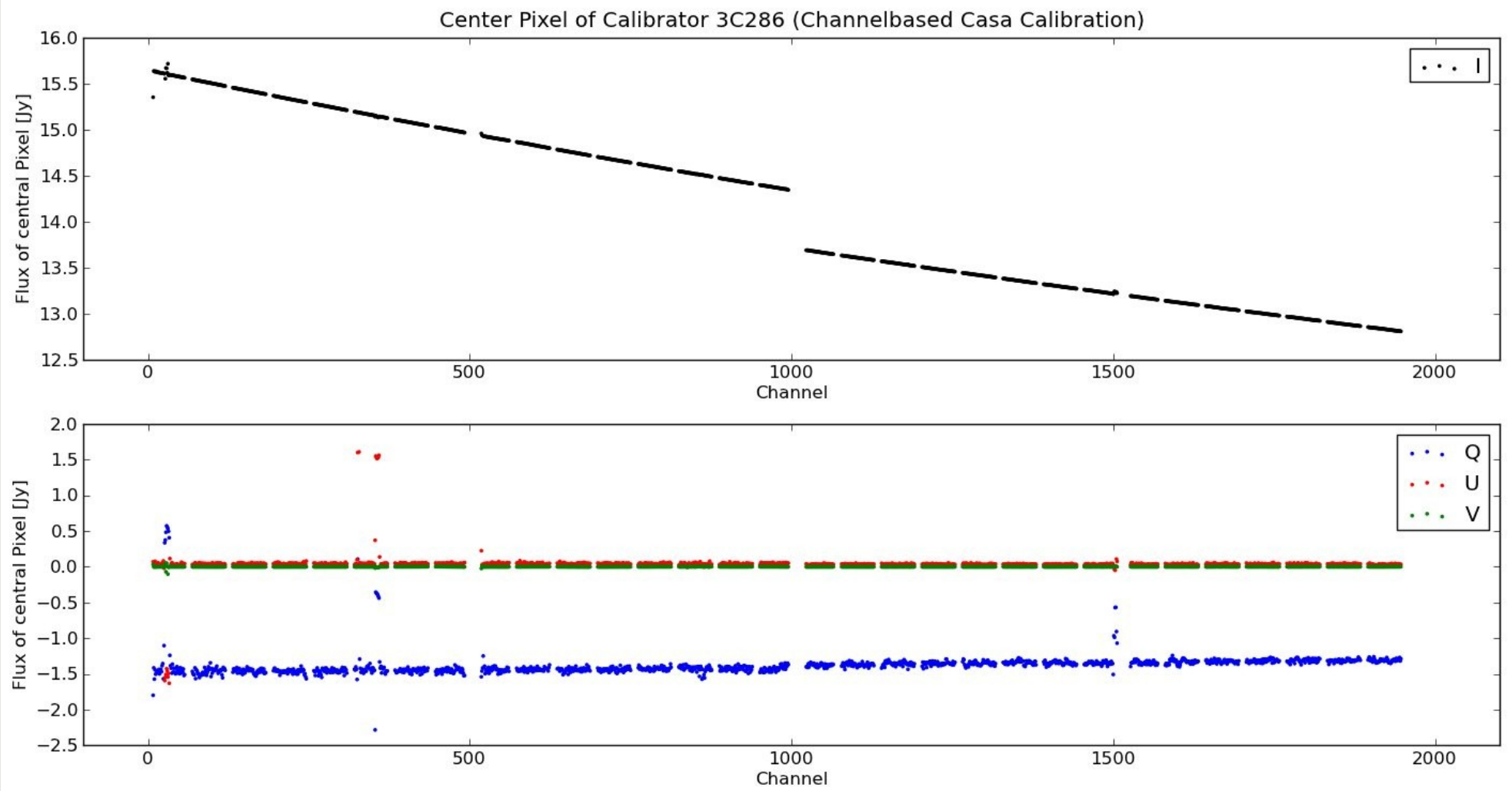

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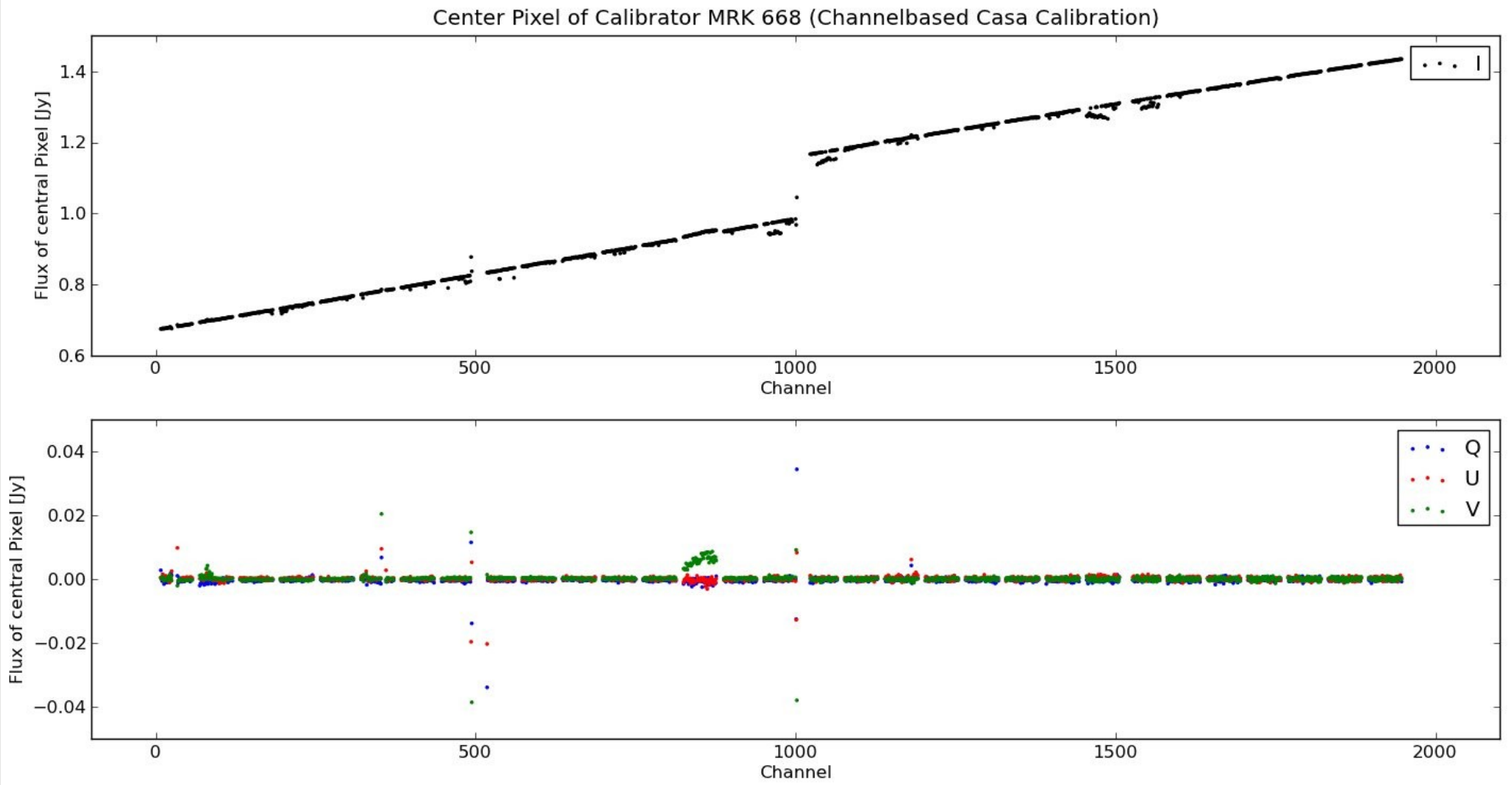

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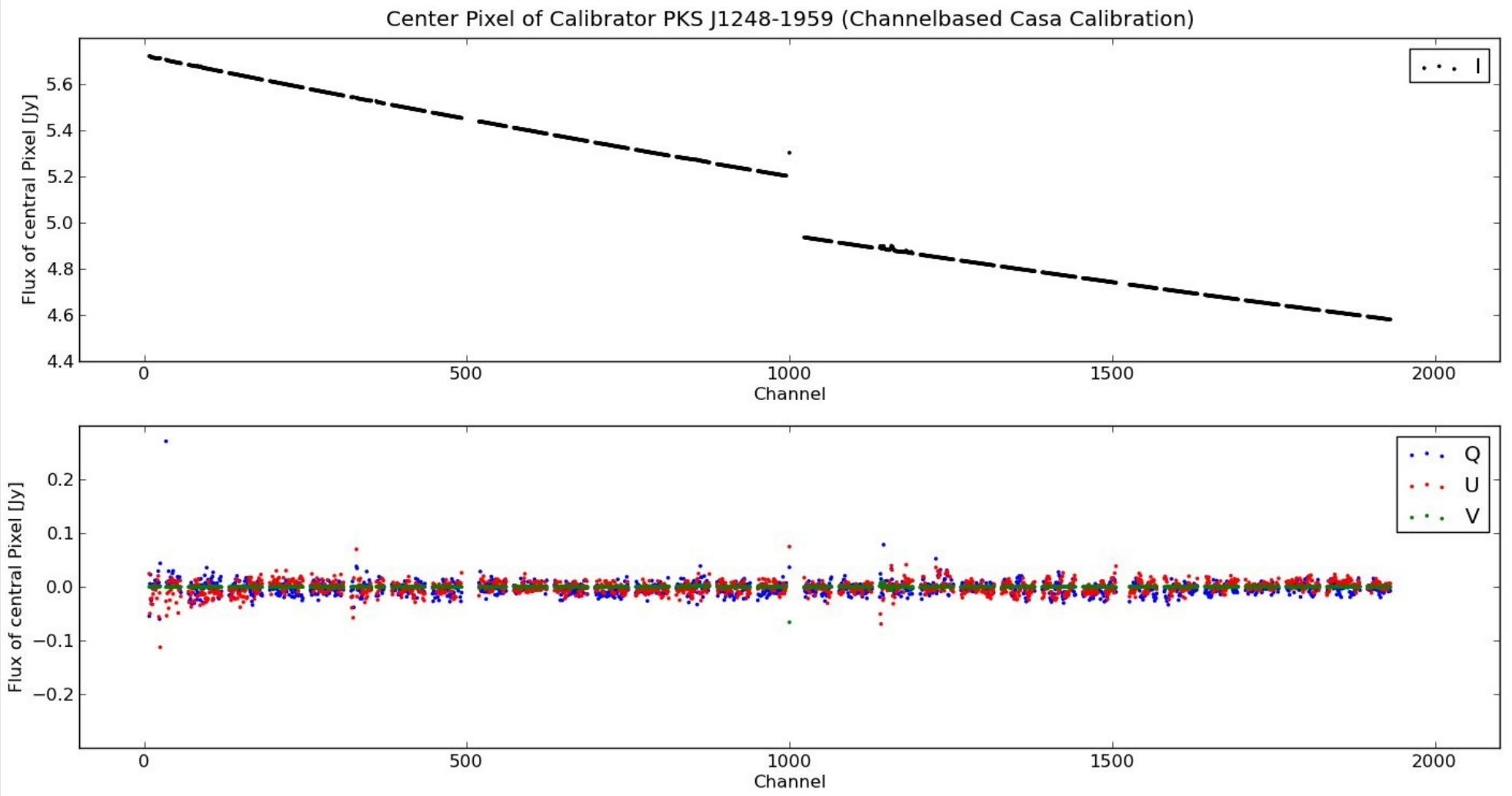

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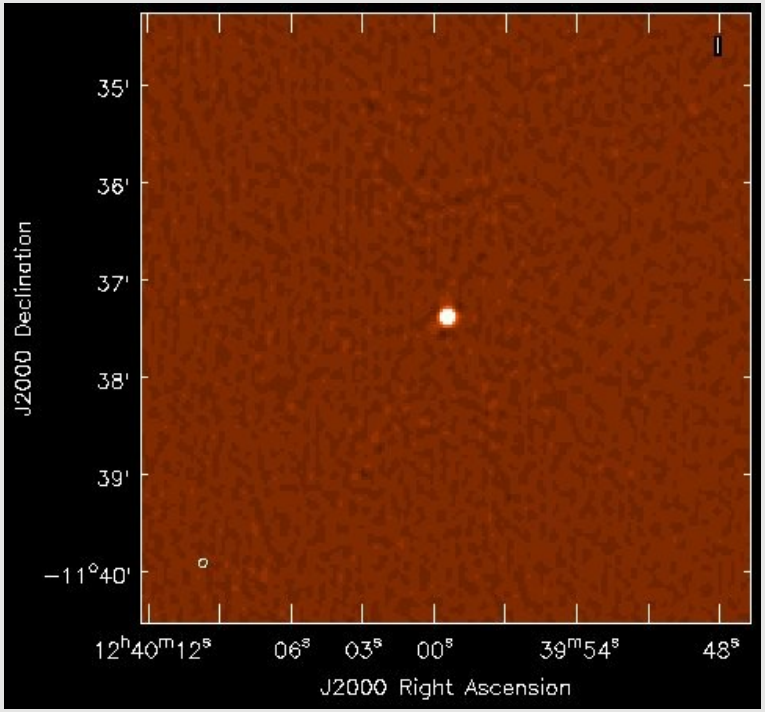
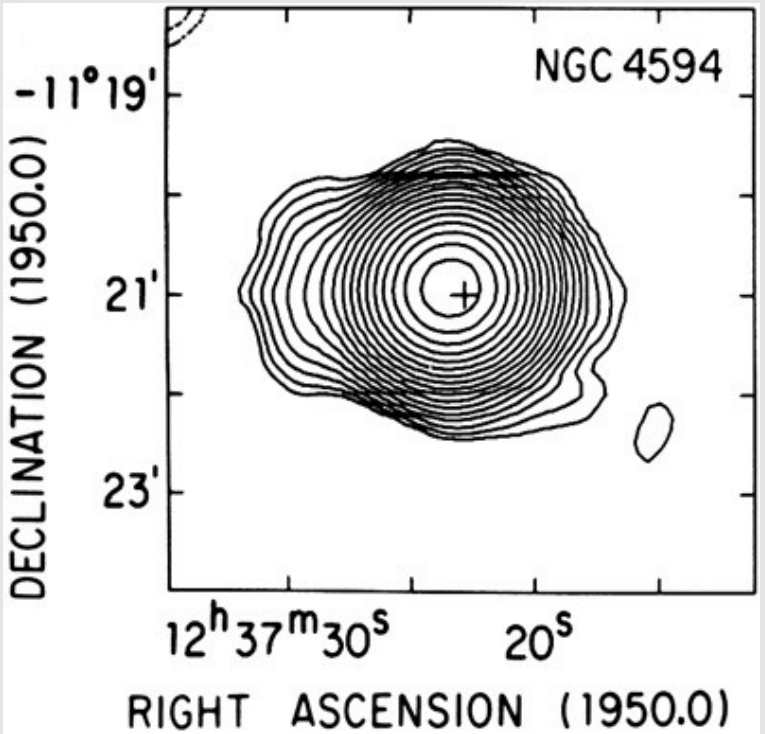
Calibration is still rather noisy and has some bad outliers.

Probably due to residual RFI.

First Image is a bit dissapointing, does not look like image from Condon et al. 1987





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Conclusions:

Flagging EVLA Data in L Band is a pain, but can be done with a good rficonsole strategy.

Calibration should be done on a per channel basis.

Thank you!