Universidad de La Laguna

Magnetism of Solar Poles

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Outline:

- Solar Magnetism
- Data description
- Preliminary results
- Conclusions & future work

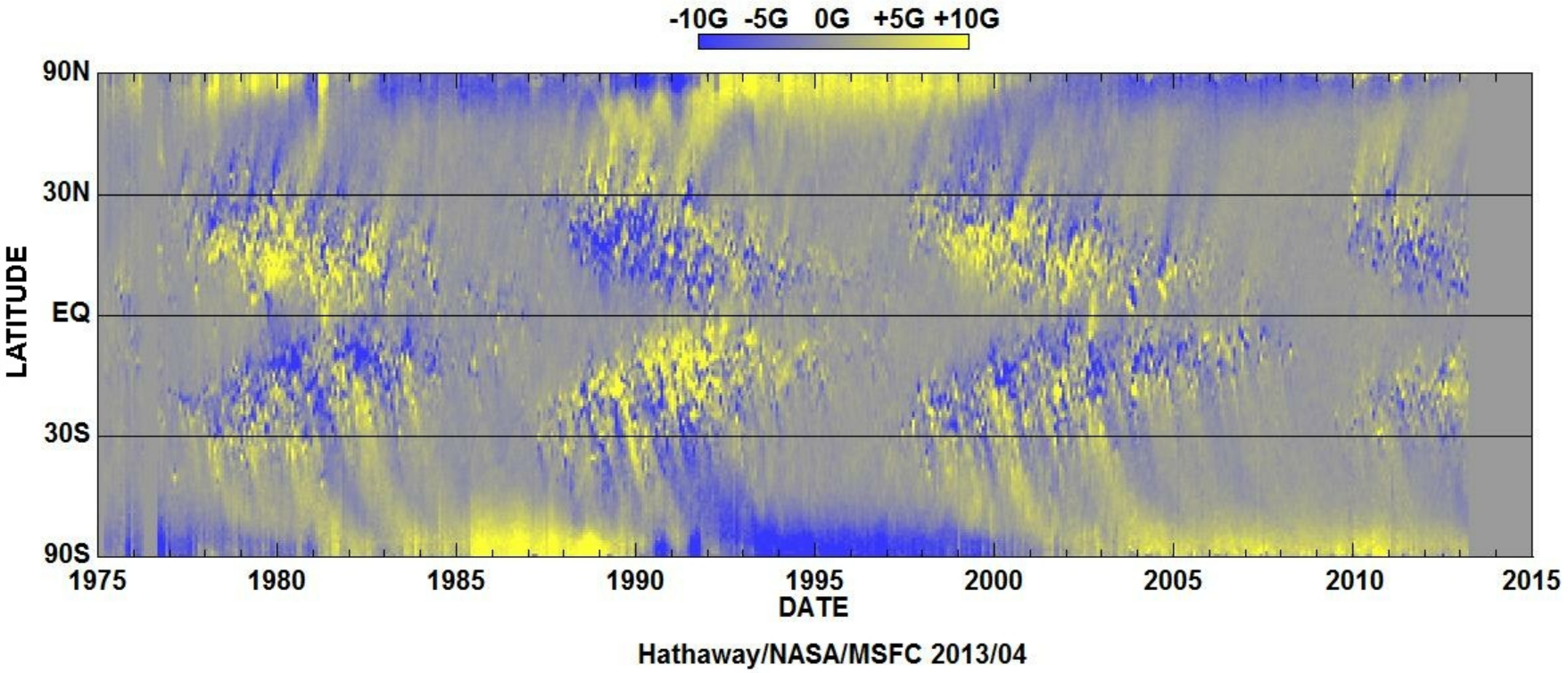
SOLAR MAGNETISM

Solar Magnetism

- 22 years solar cycle

Solar Magnetism

- 22 years solar cycle

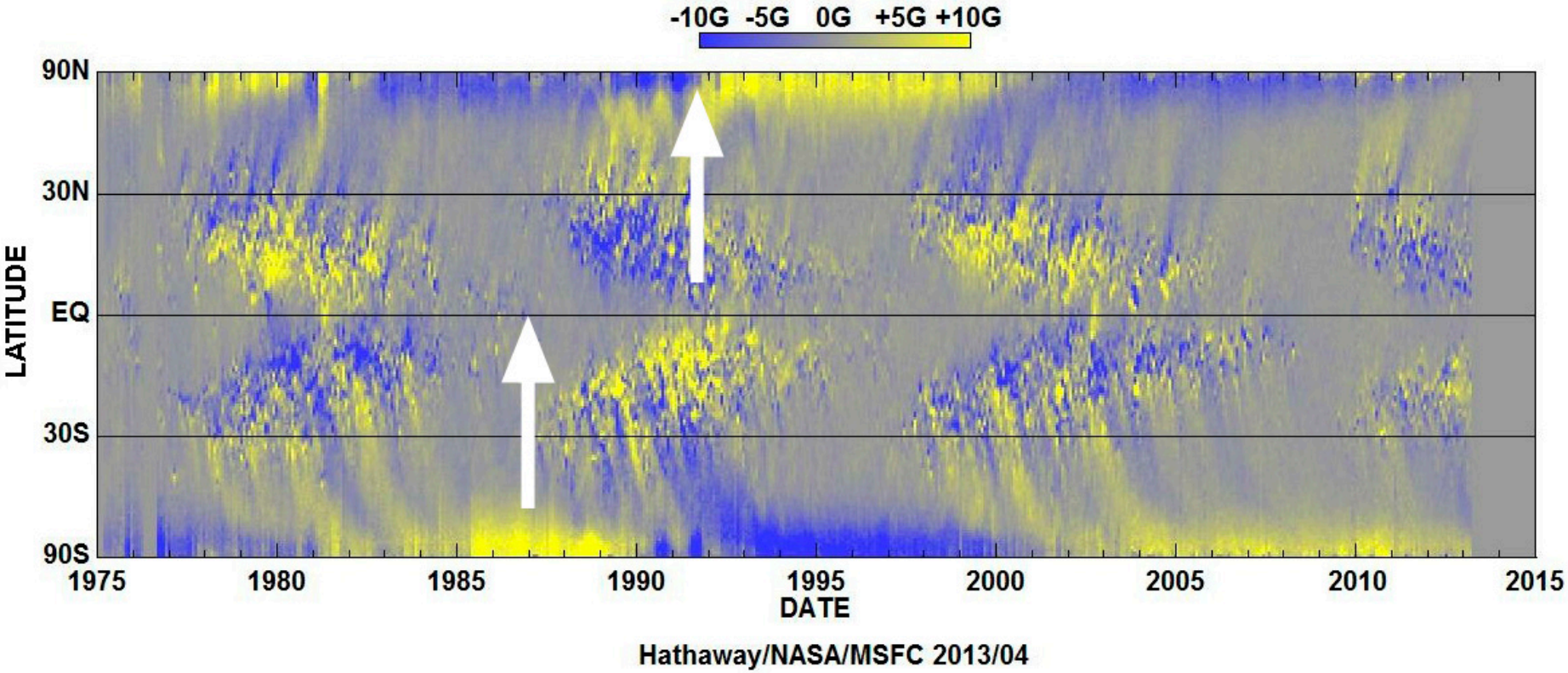


Solar Magnetism

- 22 years solar cycle
- Polarity change shifted on time

Solar Magnetism

- 22 years solar cycle
- Polarity change shifted on time



Solar Magnetism

- 22 years solar cycle
- Polarity change shifted on time
- Two differenciated components
  - Active Regions
  - Quiet Sun -> Poles

Quiet Sun

- Deeply studied: Keller et al., 1994; Lin, 1995; Grossmann-Doerth et al., 1996; Sigwarth et al., 1999; Lin & Rimmele, 1999; Sánchez Almeida & Lites, 2000; Socas-Navarro & Sánchez Almeida, 2002; Domínguez Cerdeña et al., 2003; Socas-Navarro et al., 2004; Khomenko et al., 2003; Martínez González et al., 2007
- Two components:
  - Network
  - Internetwork

Polar regions

- Less studied: Okunev & Kneer, 2004; Blanco Rodríguez et al., 2007; Tsuneta et al., 2008; Ito et al., 2010; Shiota et al., 2012
- Two components:
  - Faculae
  - Internetwork

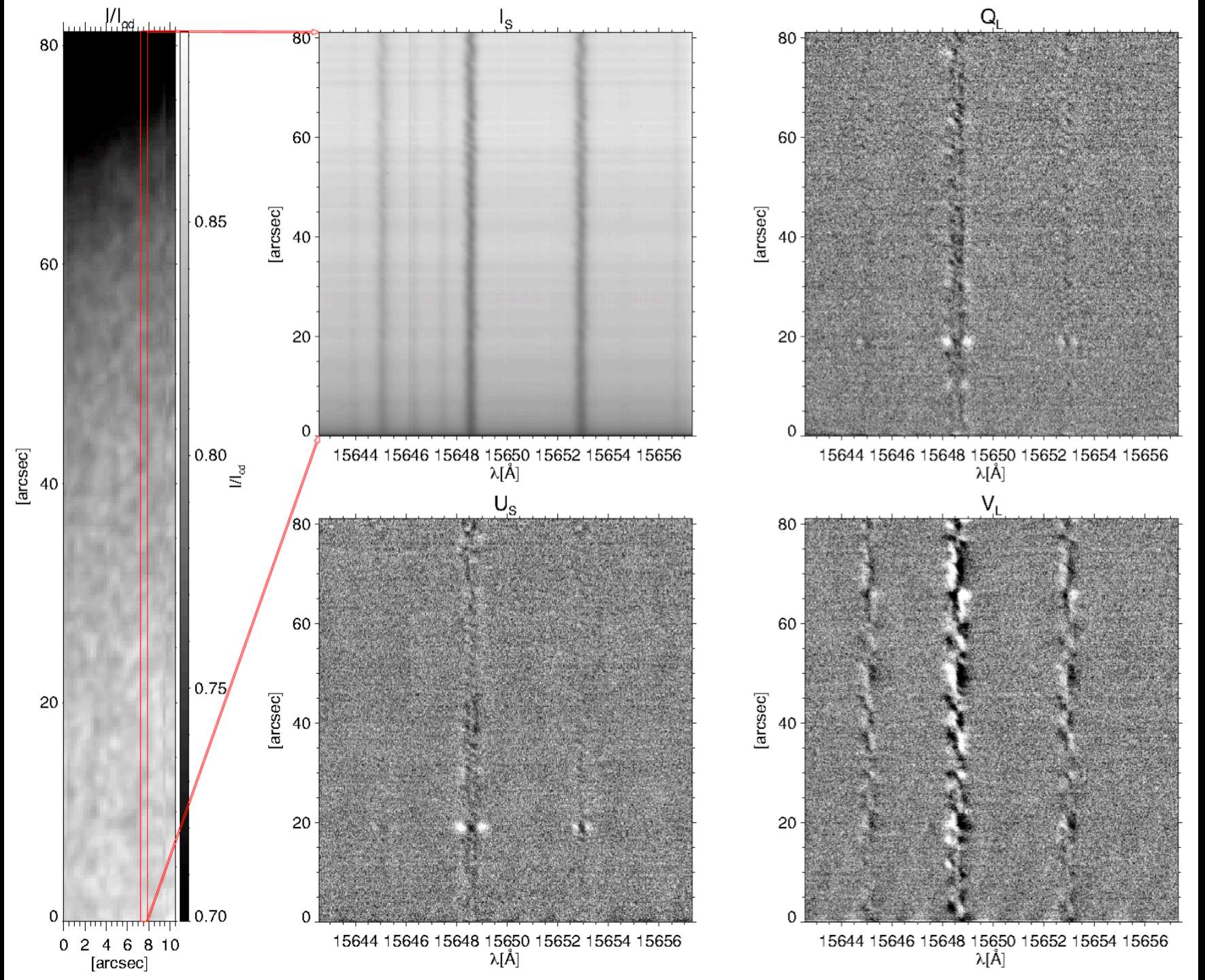
DATA

Data

- Spectropolarimetric data from VTT (TIP) and SST (CRISP)

Data

- Spectropolarimetric data from VTT (TIP) and SST (CRISP)
- VTT:
  - Slit scans
  - FeI 15645Å, 15648Å, 15652Å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Q_L
U_S
V_L
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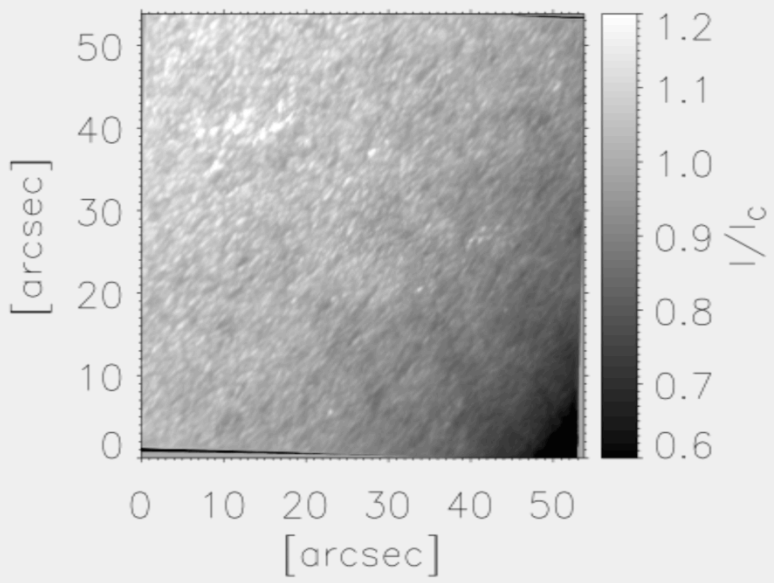
λ[Å]
0.85
0.80
0.75
0.70
0 2 4 6 8 10
0 20 40 60 80
15644 15646 15648 15650 15652 15654 15656

Data

- Spectropolarimetric data from VTT and SST
- VTT:
  - Slit scans
  - FeI 15645Å, 15648Å, 15652Å
- SST:
  - Imaging SpectroPolarimeter
  - FeI 6173Å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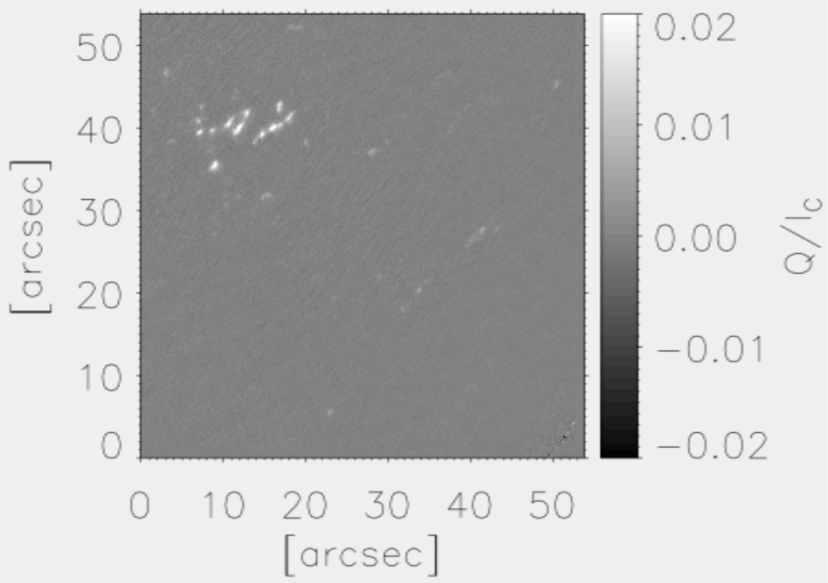
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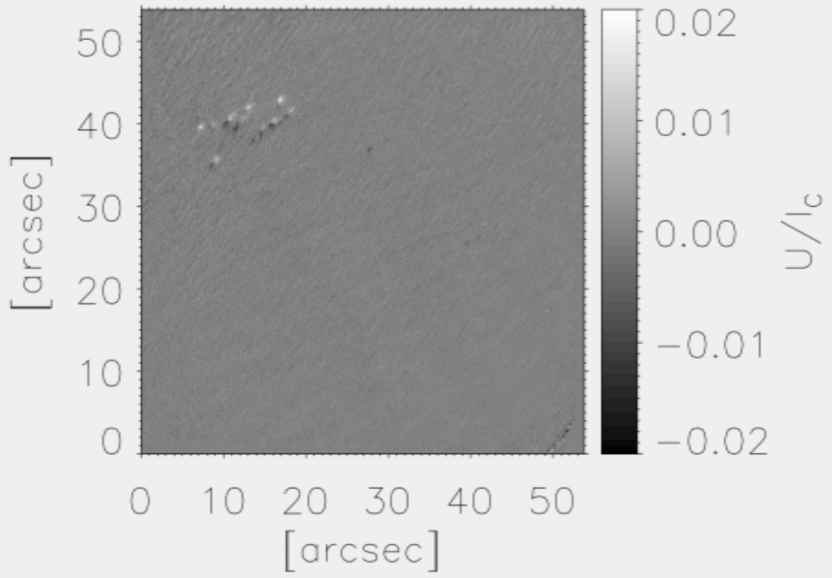
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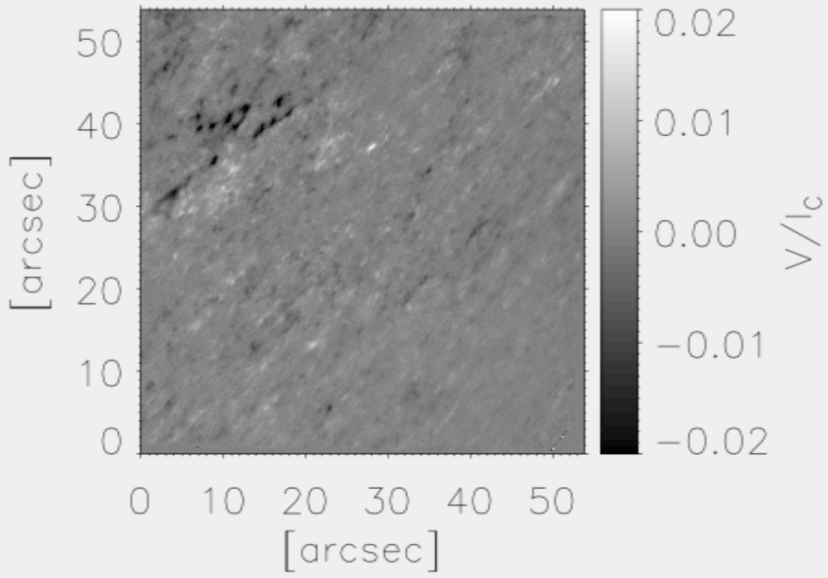
U/I_c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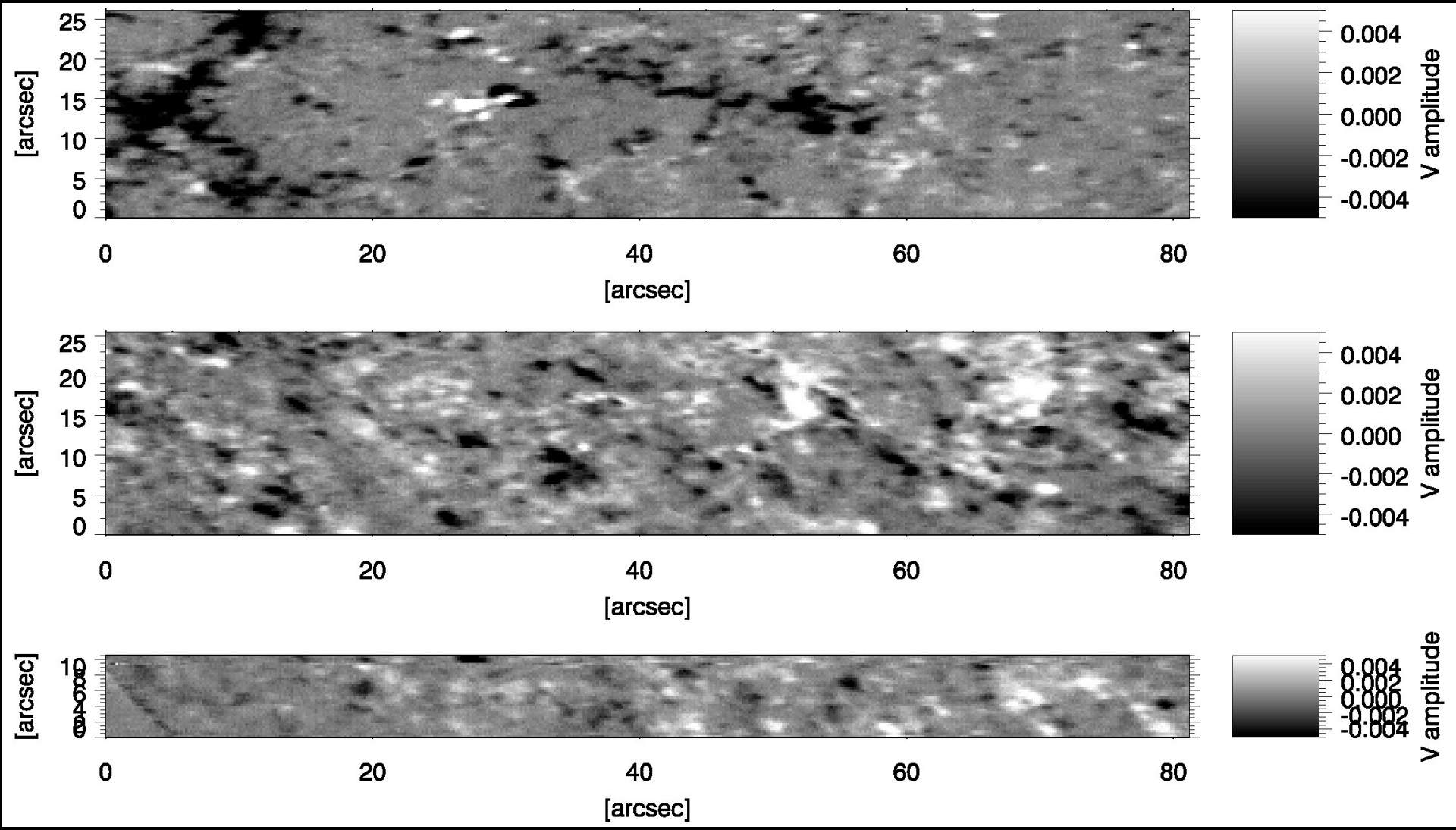
V/I_c

RESULTS (VTT)

Results

- Original data: Blue 15648Å V Stokes

Results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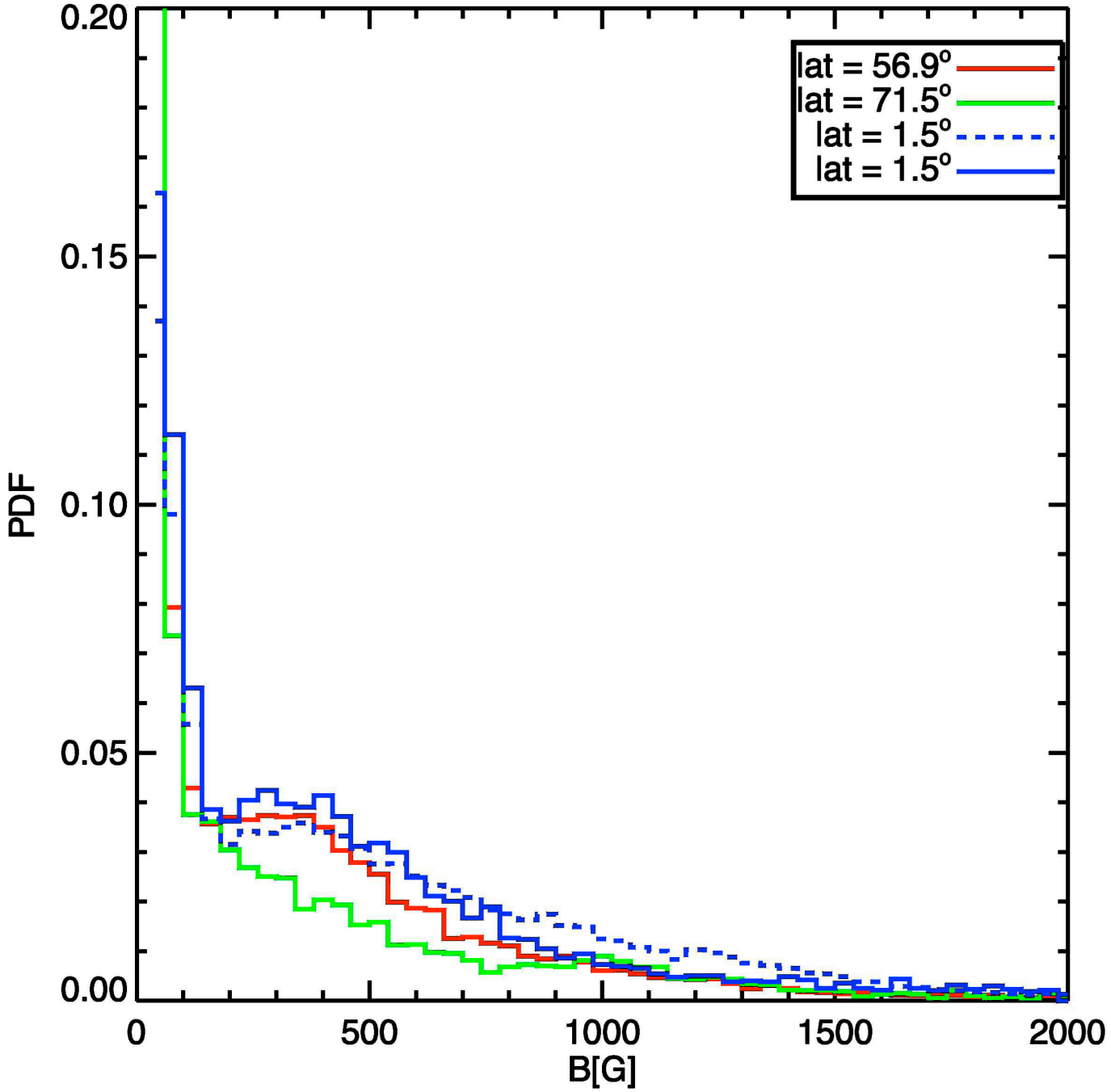
V amplitude

Results

- Original data: Blue 15750Å V Stokes
- Magnetic field intensity Probability Density Function (PDF)

- O
- M

Fu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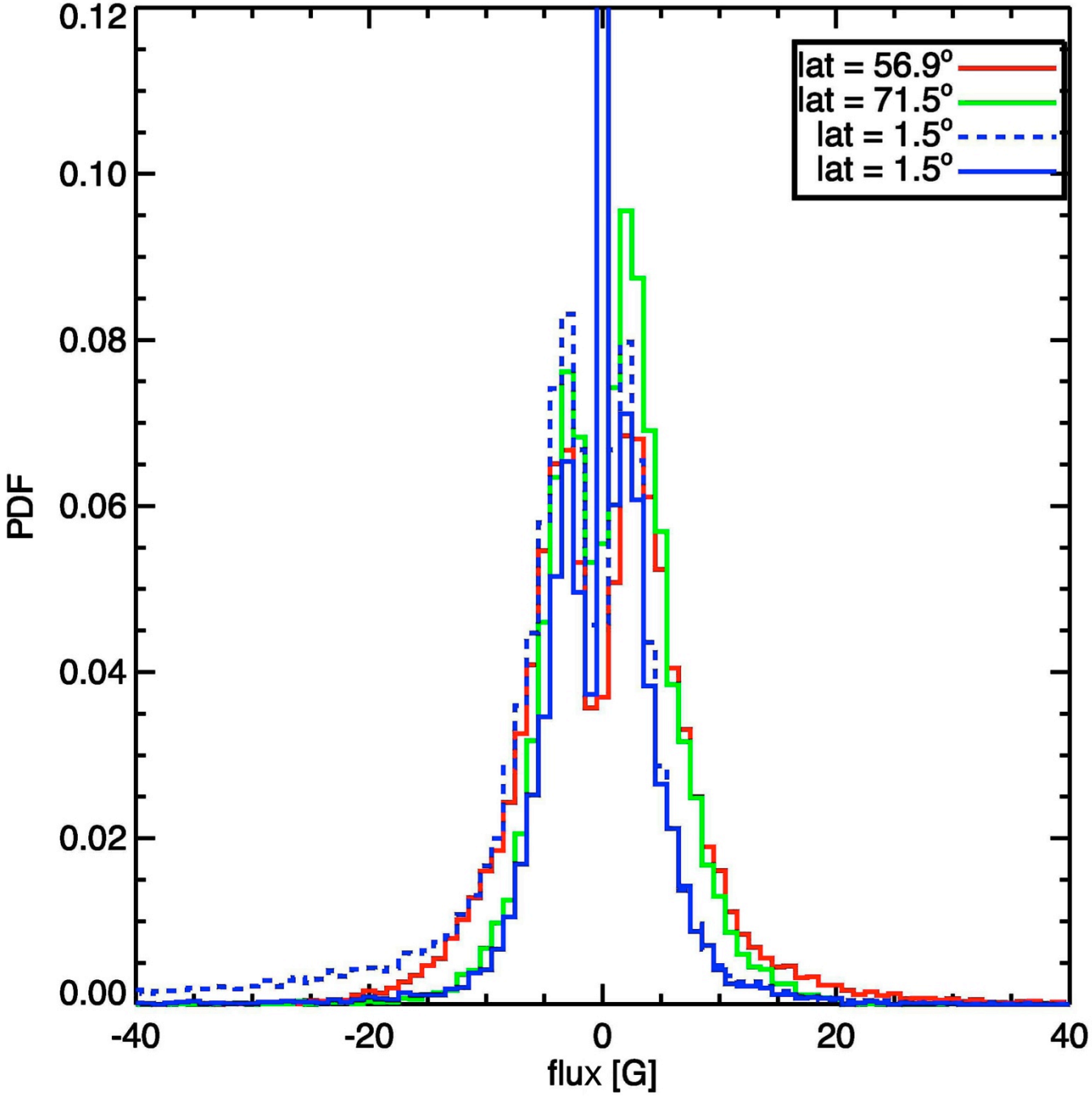
lat = 56.9°
lat = 71.5°
lat = 1.5°
lat = 1.5°

Results

- Original data: Blue 15750Å V Stokes
- Magnetic field intensity Probability Density Function (PDF)
- Magnetic flux ($\varphi=\alpha\ |B|\ \cos\gamma$) Probability Density Function (PDF)

- O
- M
  F
- M
  D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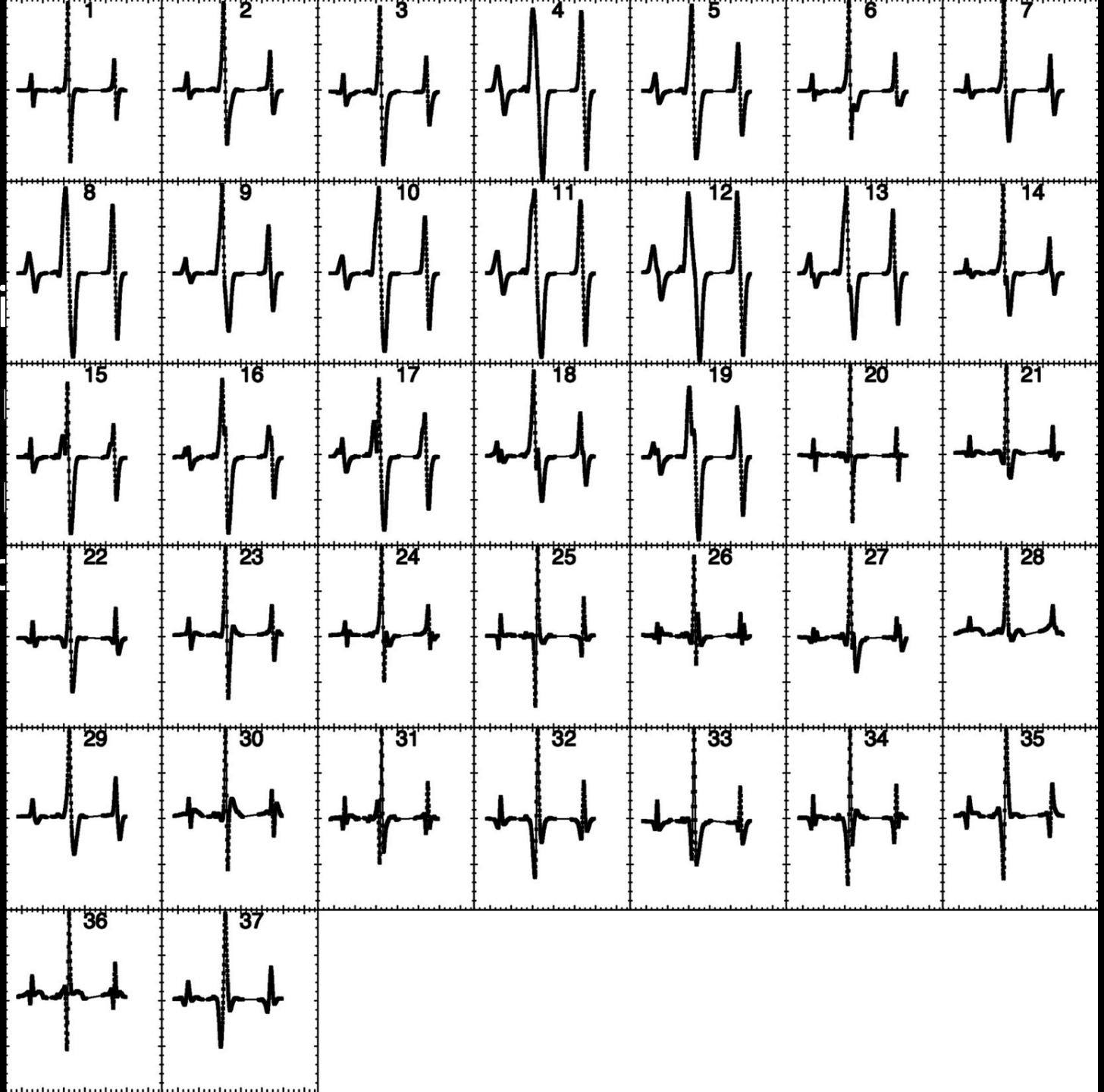
flux [G]
lat = 56.9°
lat = 71.5°
lat = 1.5°
lat = 1.5°

CONCLUSIONS & FUTURE WORK

Conclusions

- Fields of view full of magnetic signals
- Problems with the inversions
- Previous V Stokes classifications in order to follow different inversion strategies

- Fi
- P
- P
  fc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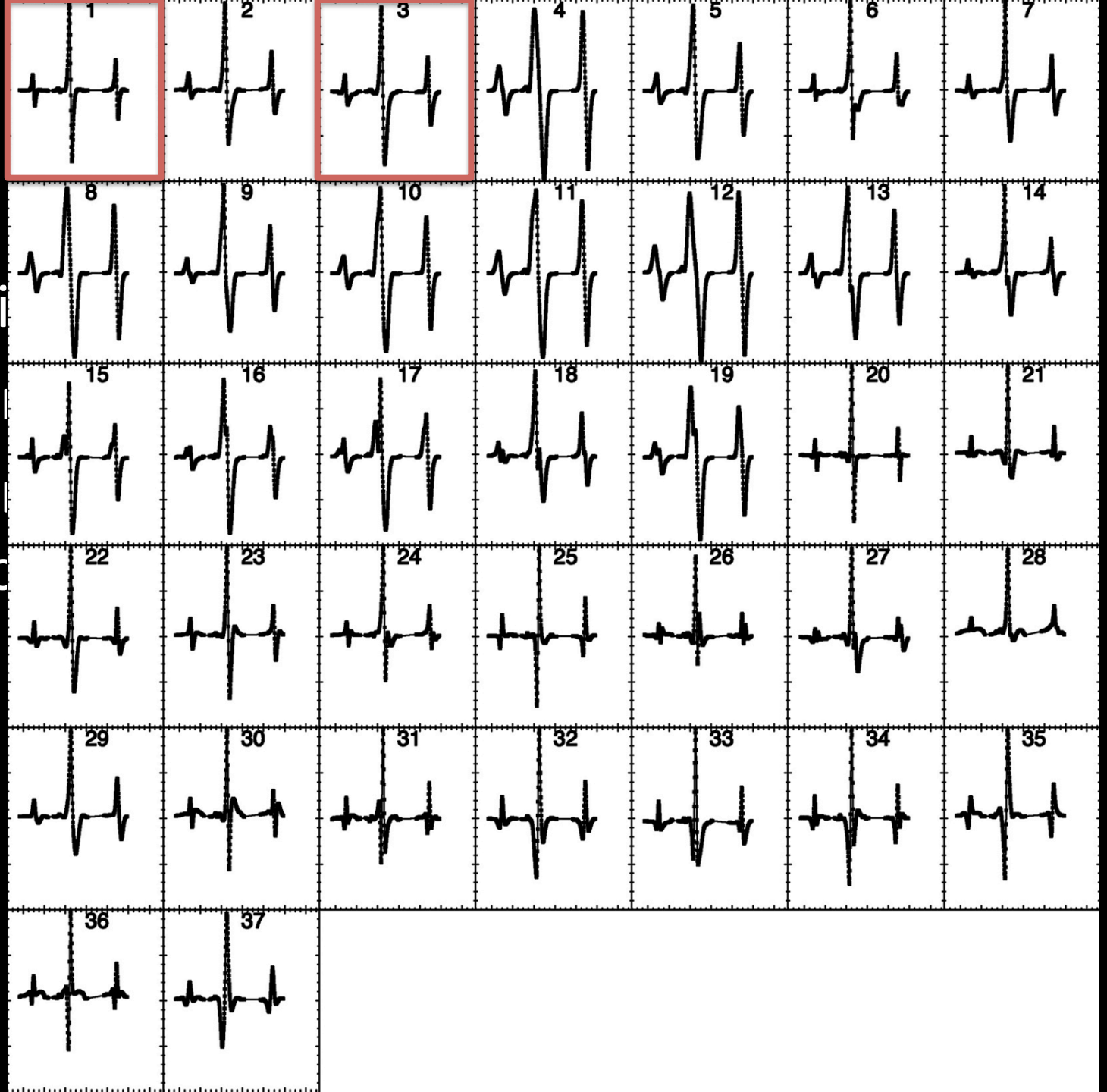
- Fi
- P
- P
fc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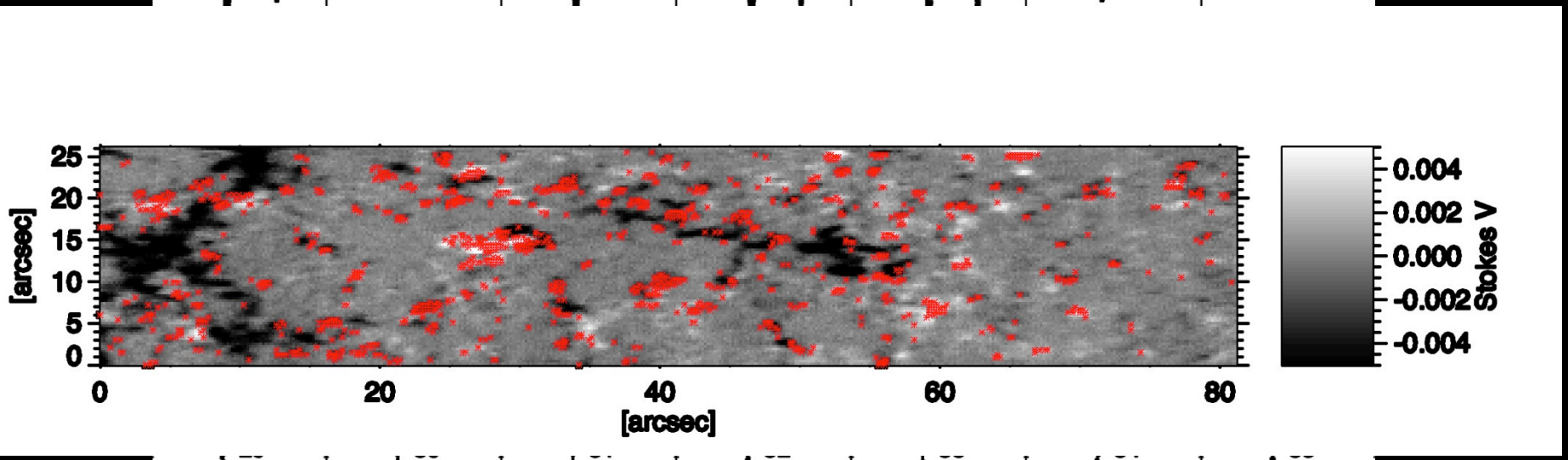
- Fi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Stokes V

- Fi
- P
- P
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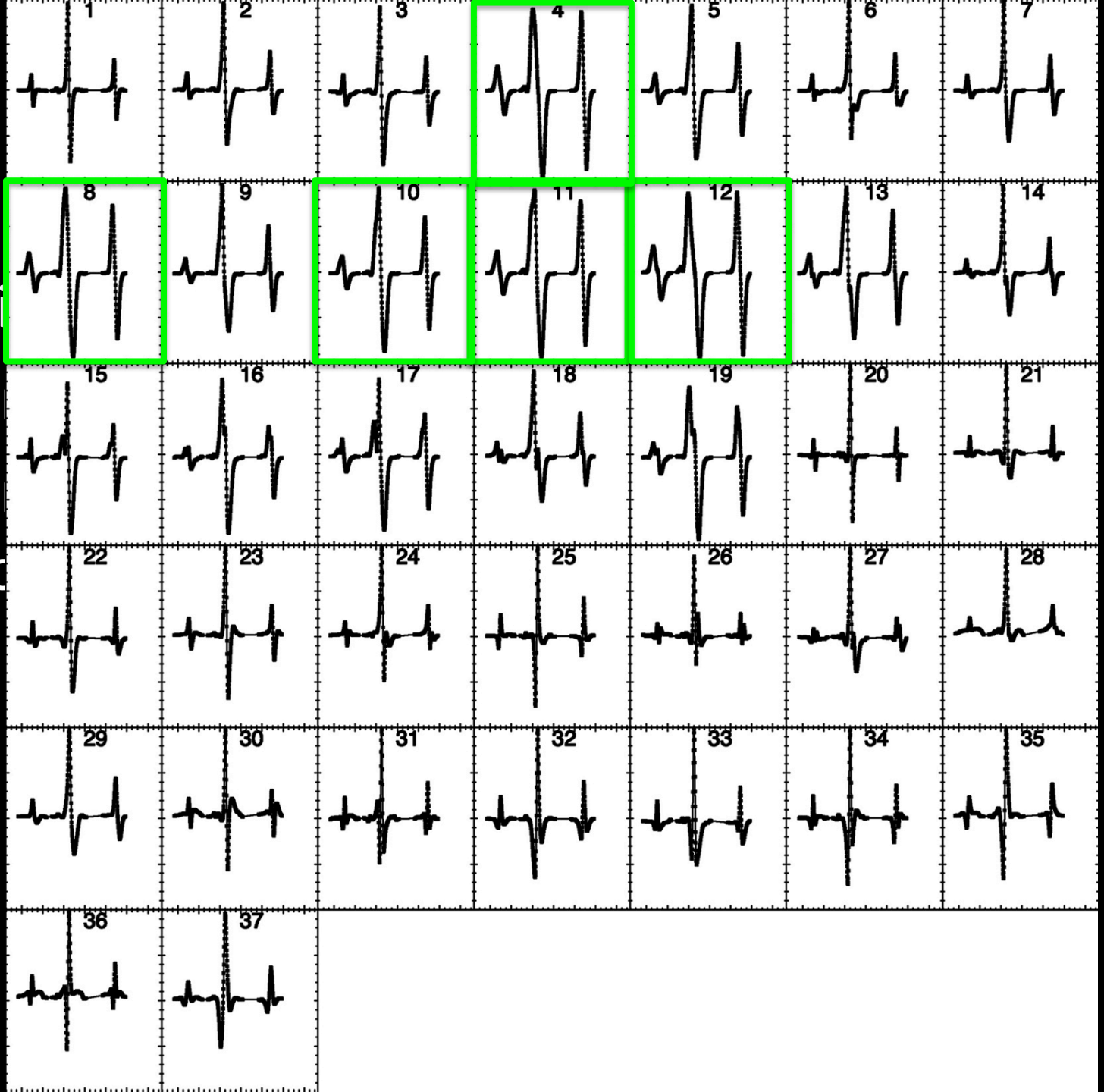
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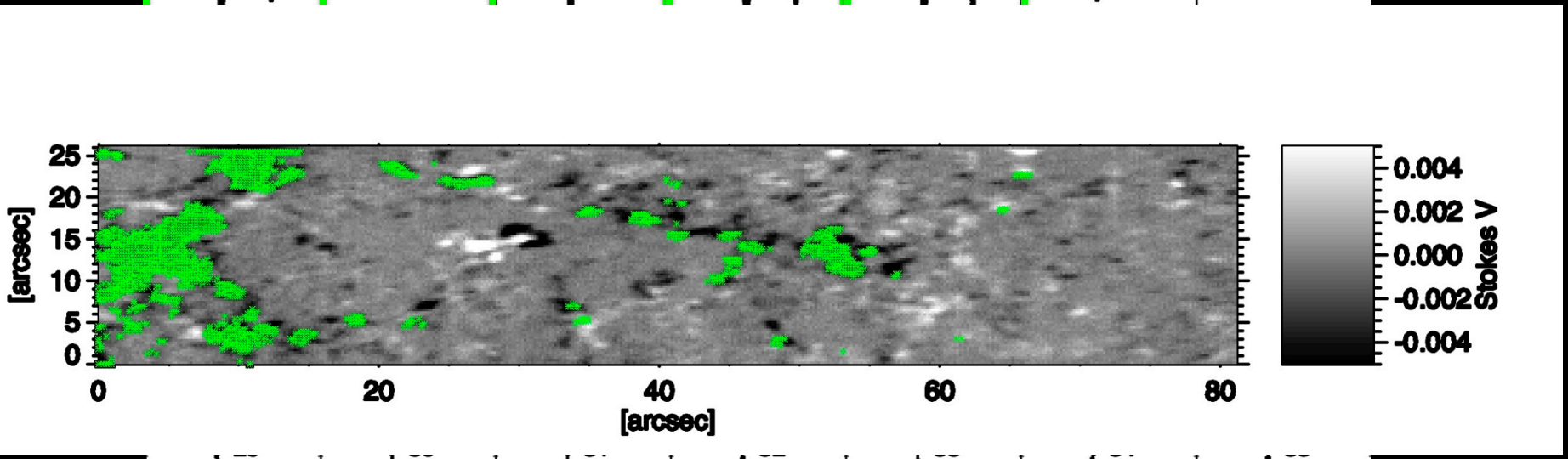
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Stokes V

- Fi
- P
- P
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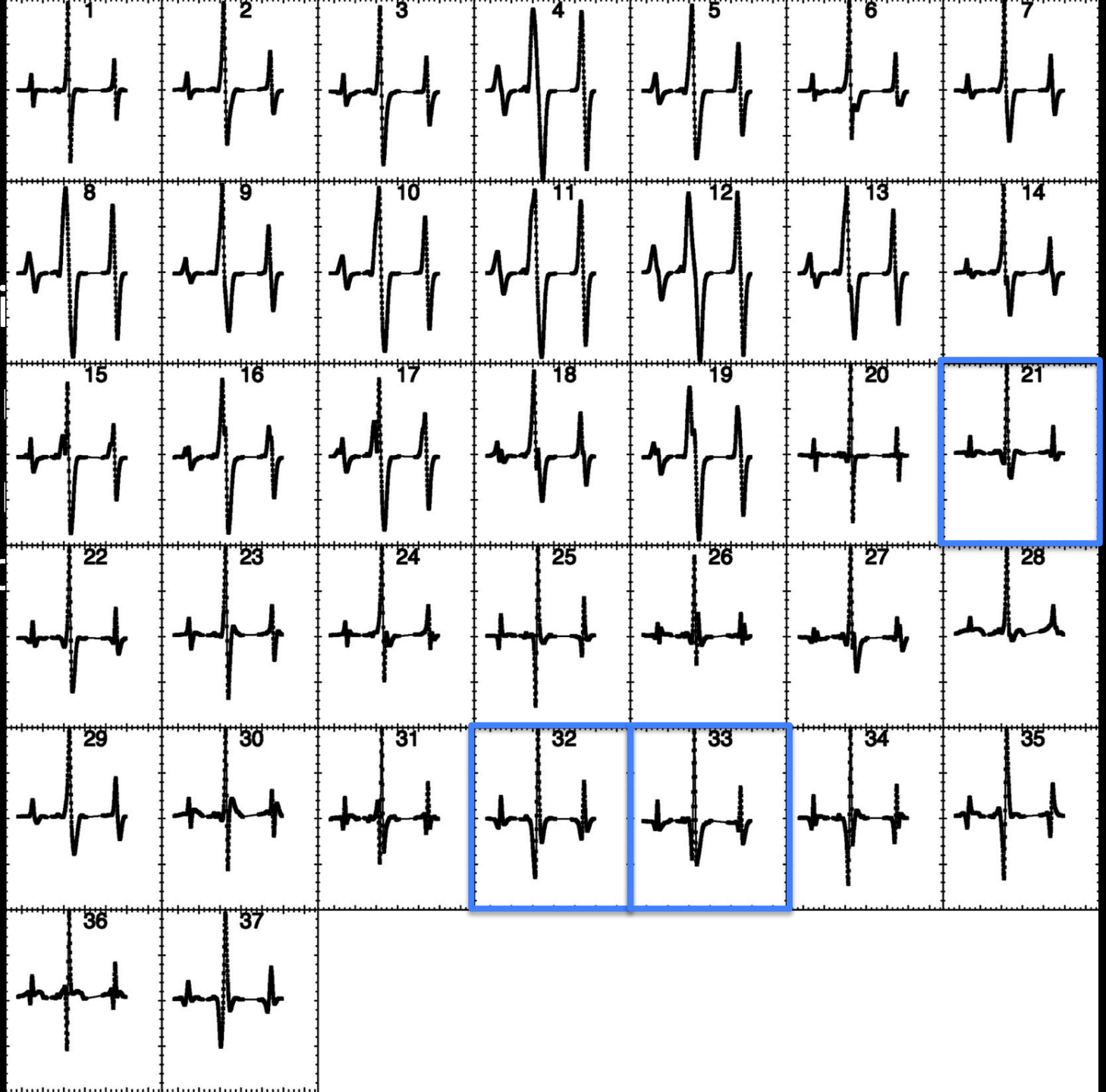
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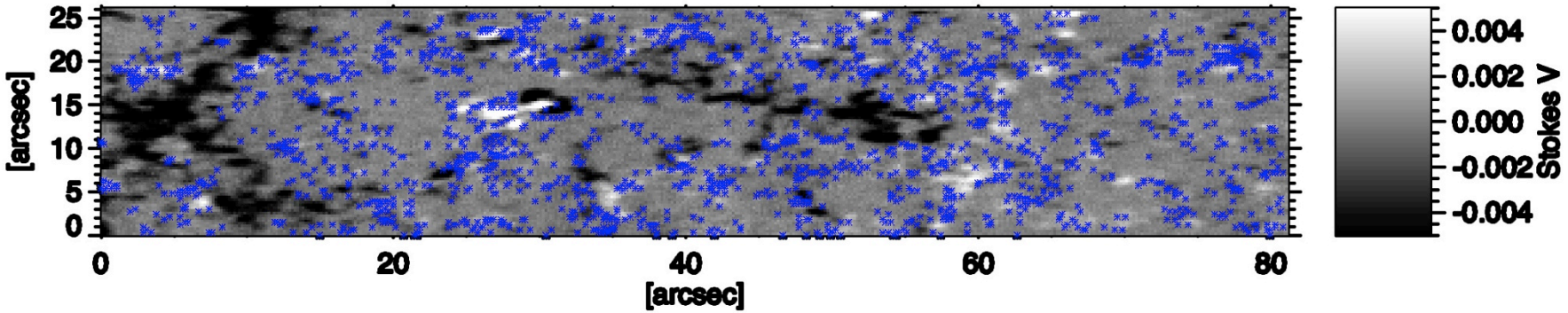
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Stokes V

Conclusions

- Fields of view full of magnetic signals
- Problems with the inversions
- Previous V Stokes classifications in order to follow different inversion strategies
- Continue observing (VTT, GREGOR, SST)
- Study low latitude QS in the limbs
- Complement the statistical analysis with particular features analysis
- Bigger Fields of View

THANK YOU!