Frontiers of Radio Astronomy

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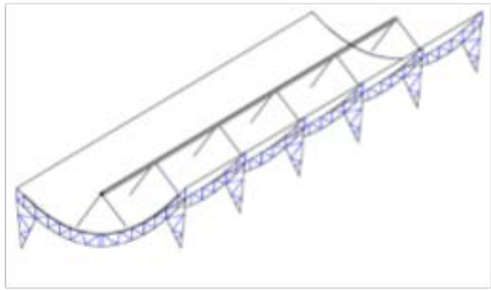
"There is nothing new in radio astronomy"

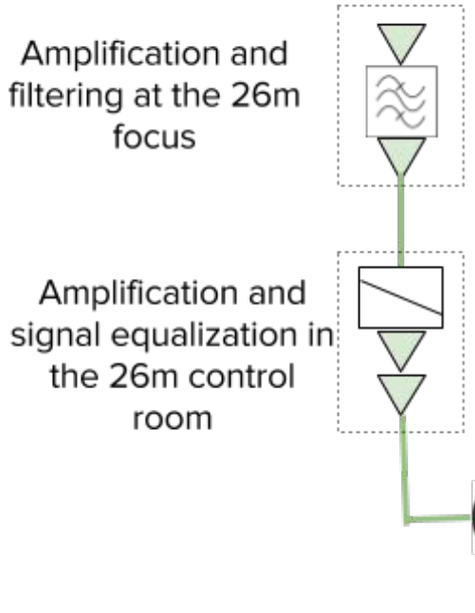
- Tom L. (Collaborator)

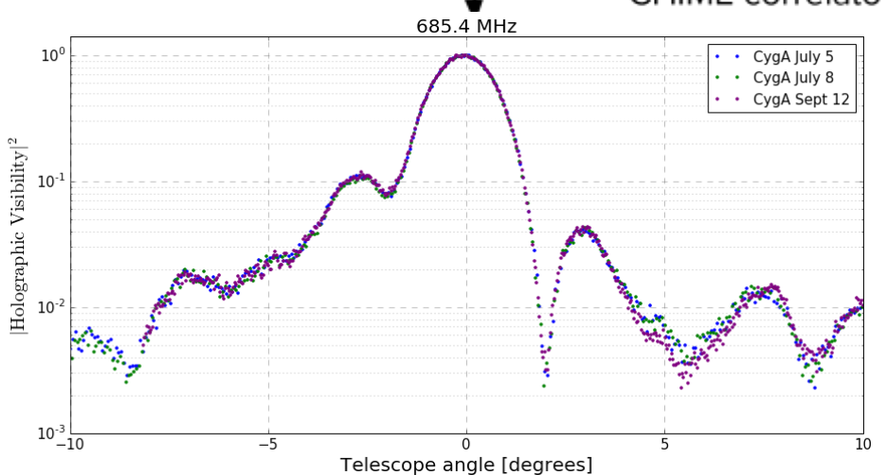
Sort of.

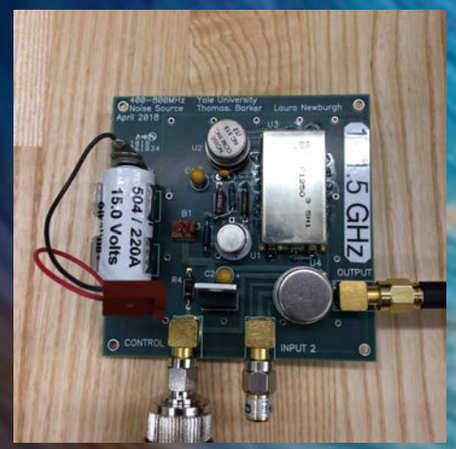
Calibrate with Holography

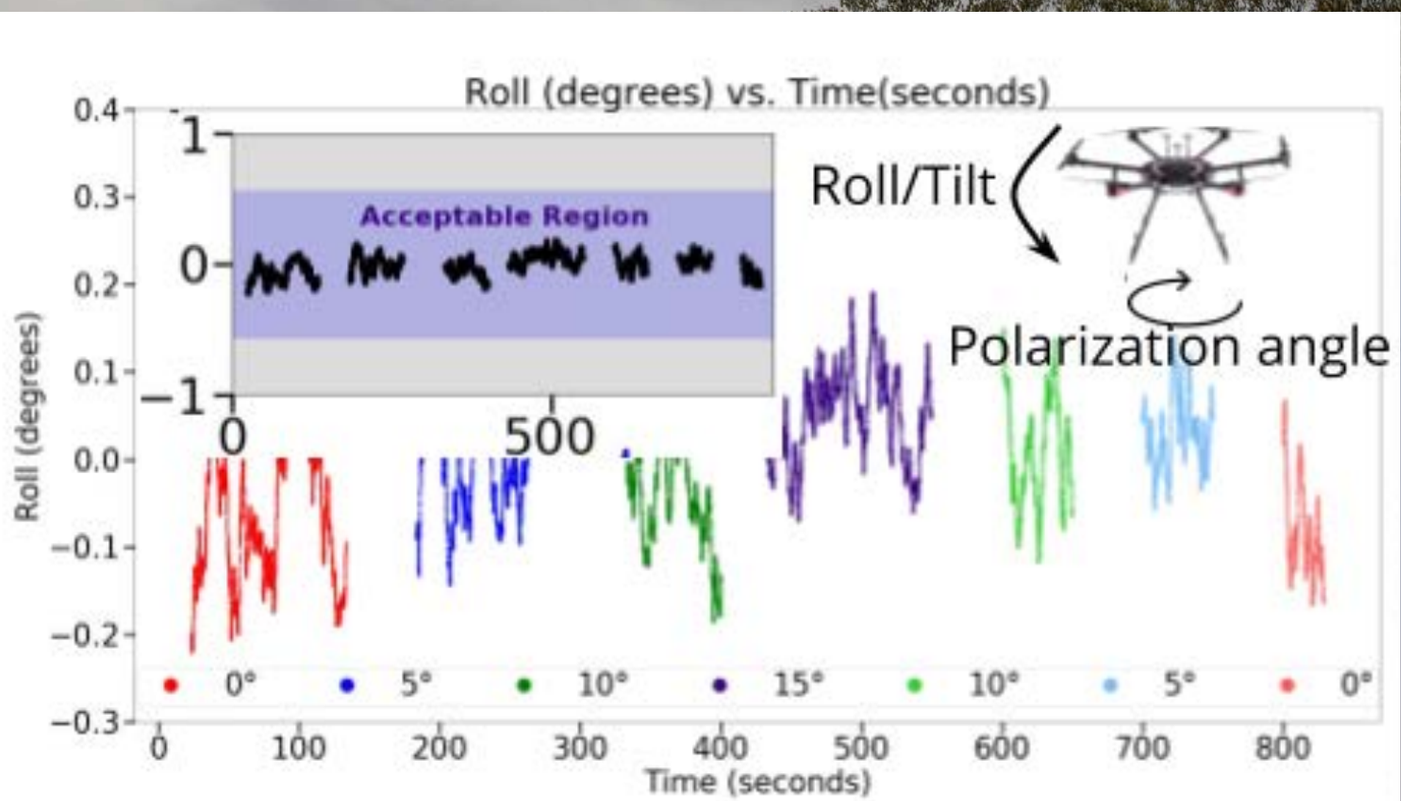
Tracking dish

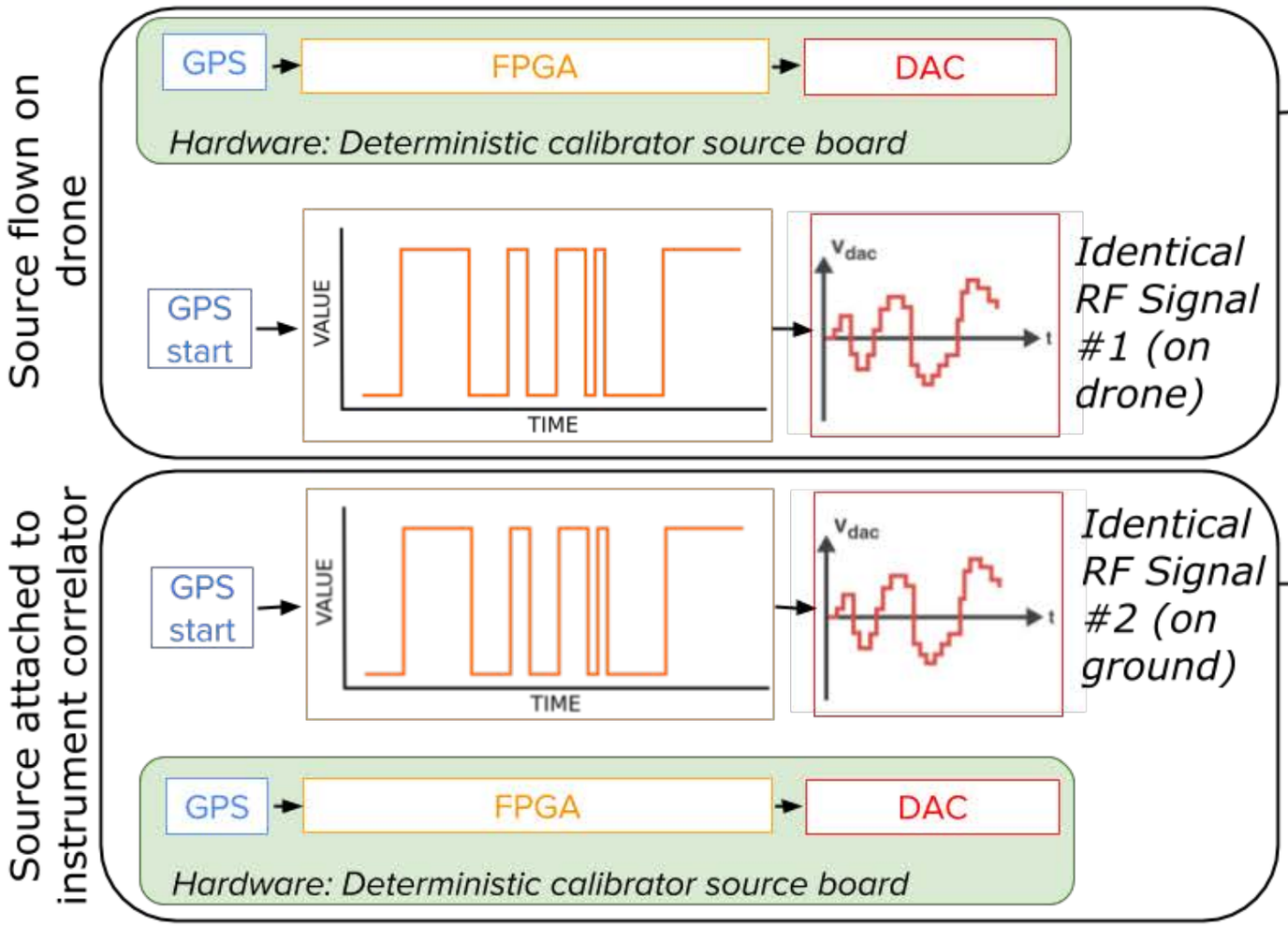







1.5 GHz
504 / 220A
15.0 Volts
CONTROL
INPUT 2
OUTPUT


Roll (degrees) vs. Time(seconds)
Acceptable Region
Roll/Tilt
Polarization angle
Roll (degrees)
Time (seconds)
0°
5°
10°
15°
10°
5°
0°



Critical needs: digital/FPGA development, electrical engineering

Instrumentation initiative could help by: aiding partnerships for electrical/digital development

What can I (postdocs/grad students) offer: drones, telescopes, mechanical and optical designs, radio noise testing facilities

Thanks!
(backup)


Brian Koopman
(postdoc)


Ben Saliwanchik
(postdoc)

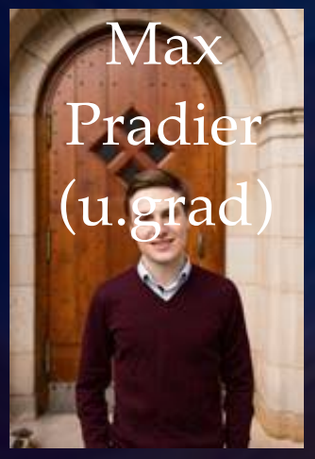

Emily Kuhn
(grad)


Lauren Saunders
(grad)


Kaustav Mitra
(grad)


Uddipan Banik
(grad)


Sanah
Bhimani
(gap year)


Max
Pradier
(u.grad)


Sam Day-Weiss
(u.grad)
LIGO

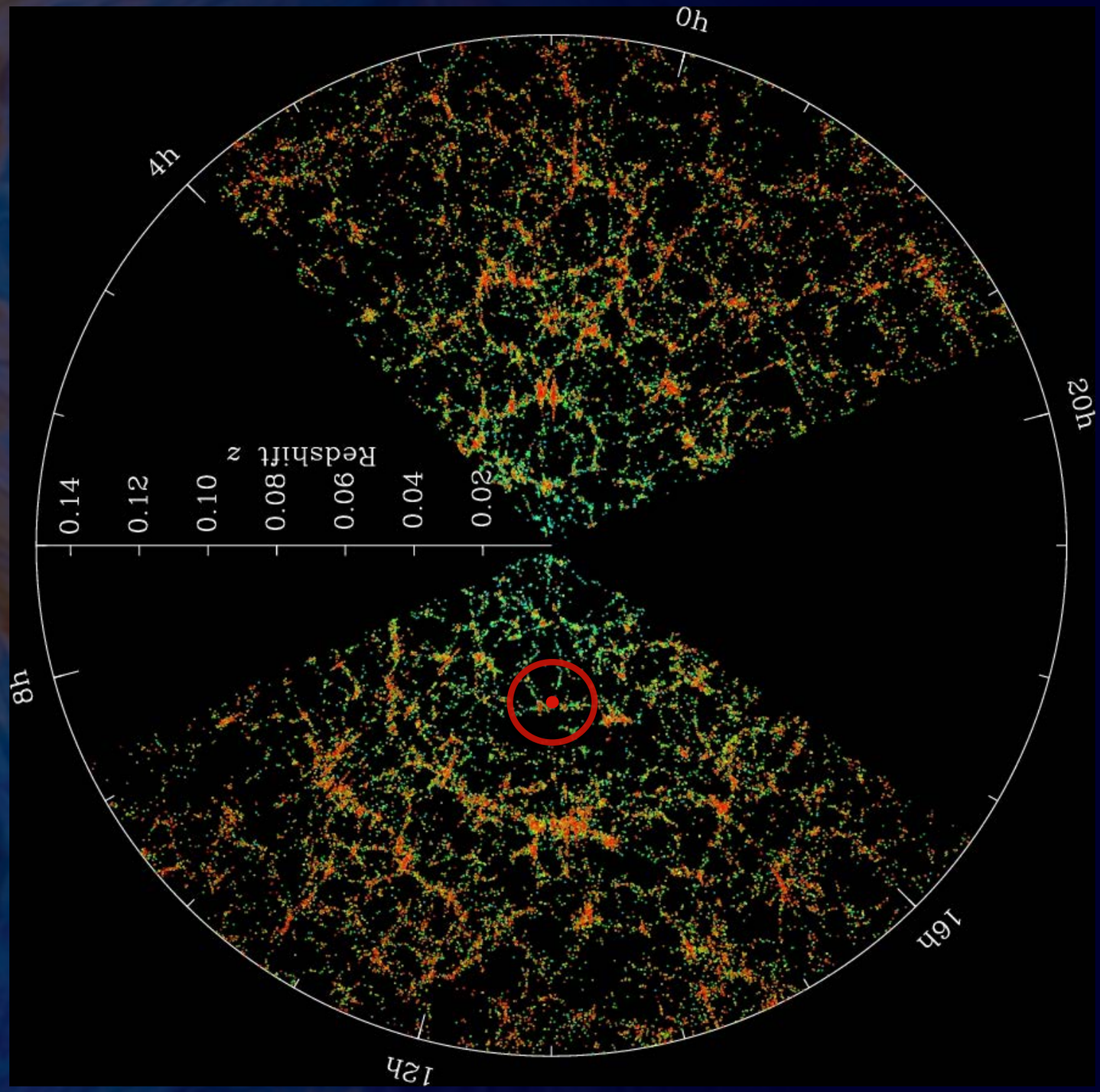

Ry Walker
(u.grad)

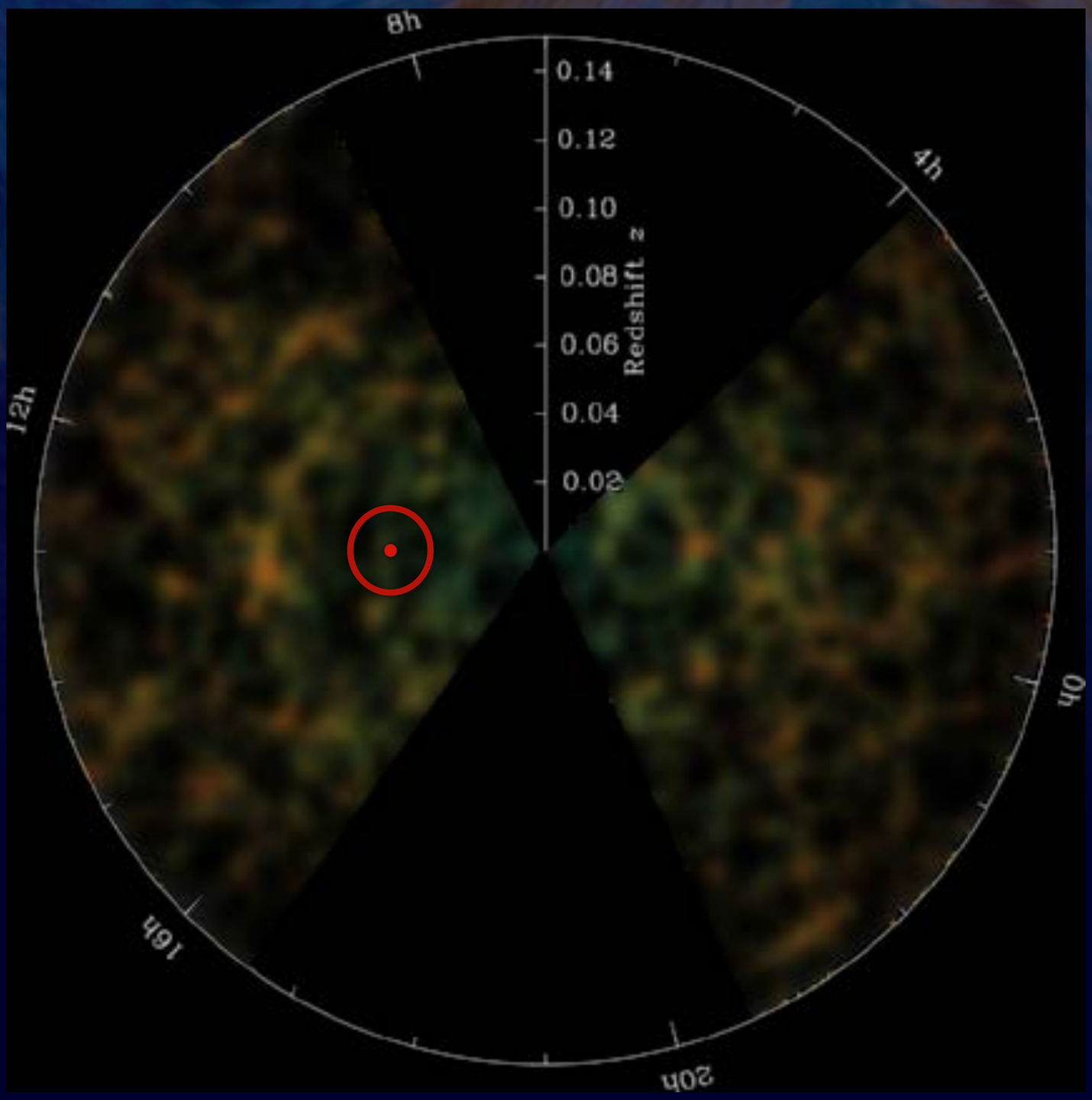
Who has heard of Dark Energy?

Who knows what fundamental models explain Dark Energy?

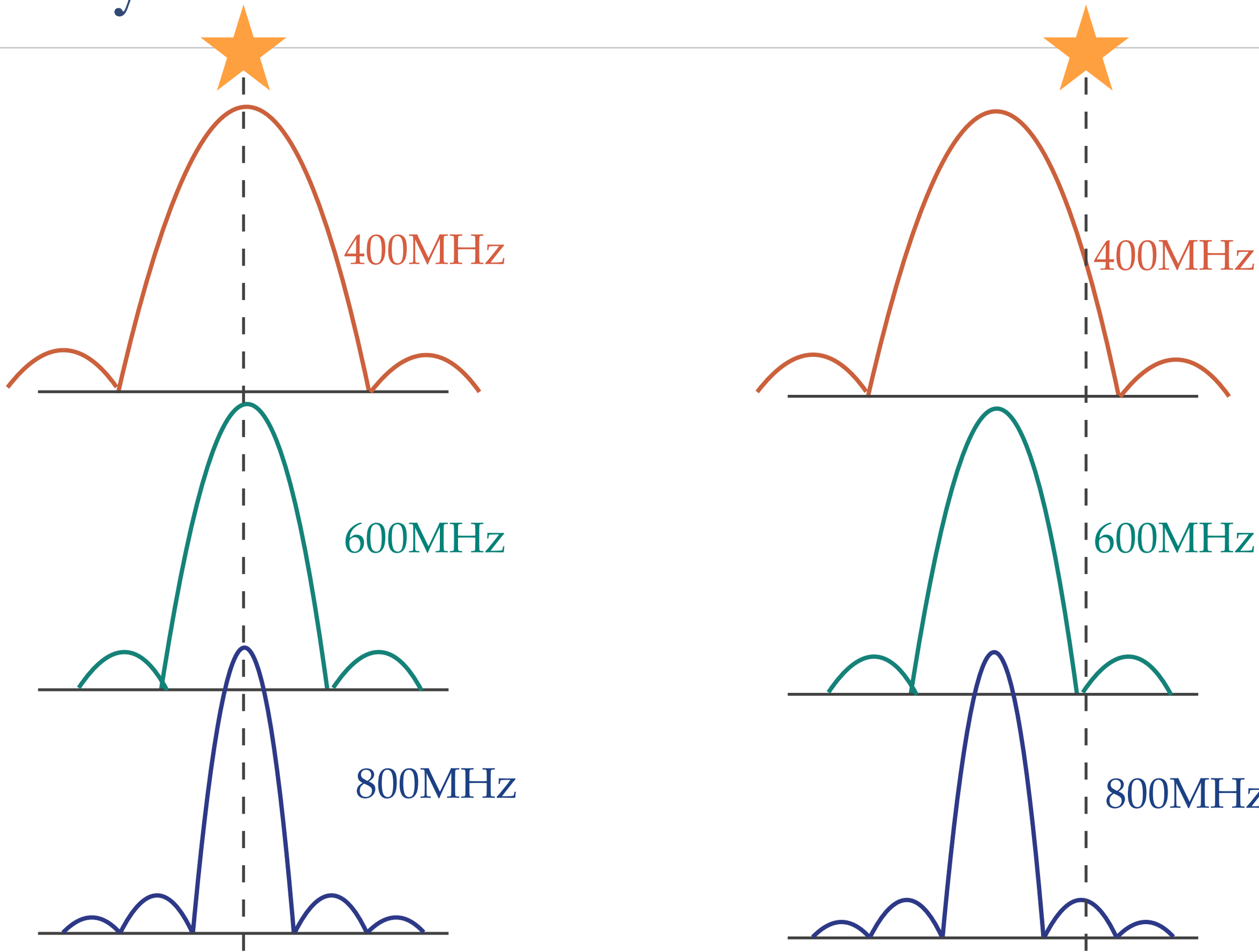
Huge (100mx20m) cylindrical telescopes to see radio light
(CHIME)
British Columbia, Canada

6-m Telescopes to see infant Universe
(Simons Observatory, CMB-S4)
Atacama Desert, Chile

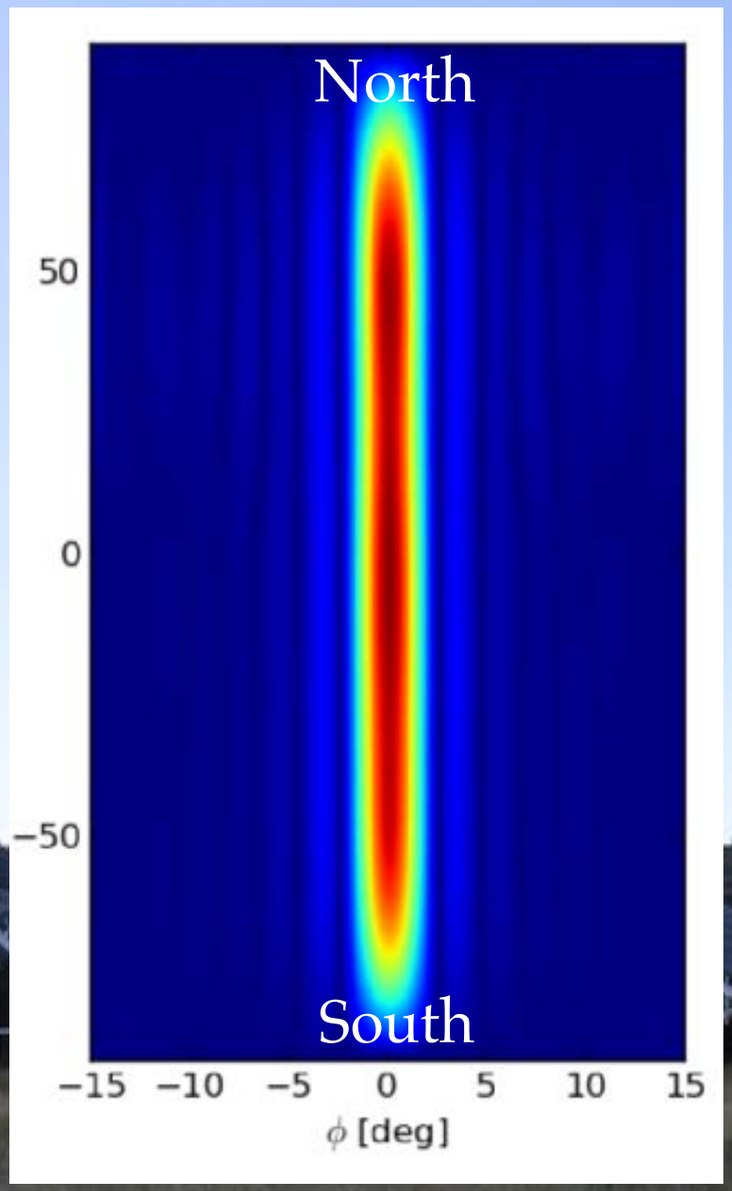

0h
4h
8h
12h
16h
20h
Redshift z
0.02
0.04
0.06
0.08
0.10
0.12
0.14

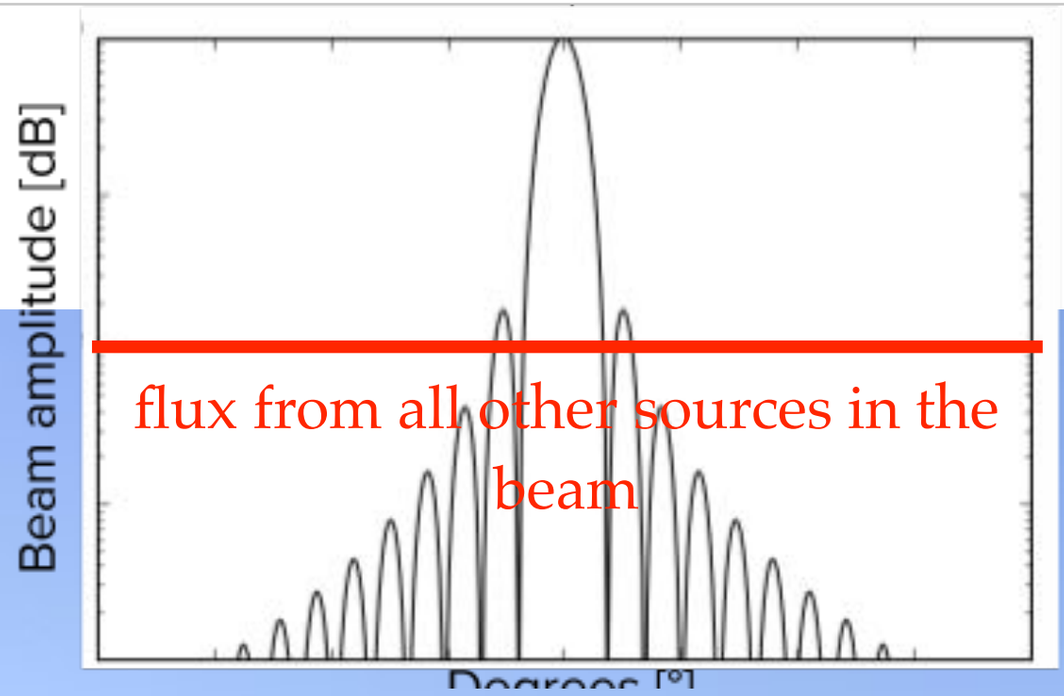

8h
4h
0h
20h
16h
12h
0.14
0.12
0.10
0.08
0.06
0.04
0.02
Redshift z

Why Do We Have to Know the Beams?

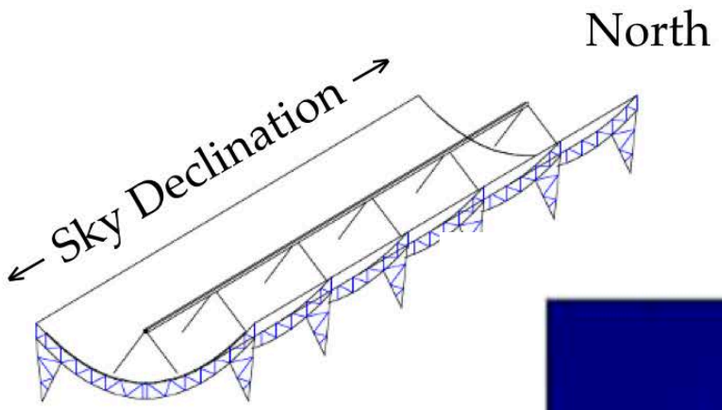


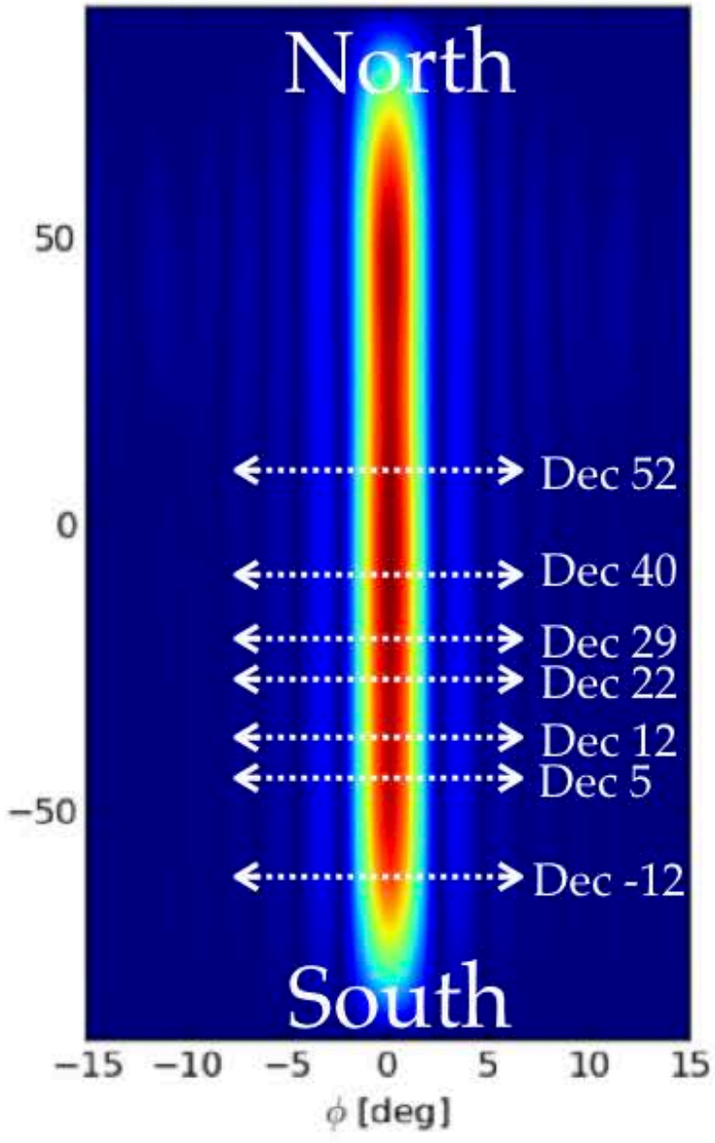
The reason this is hard…



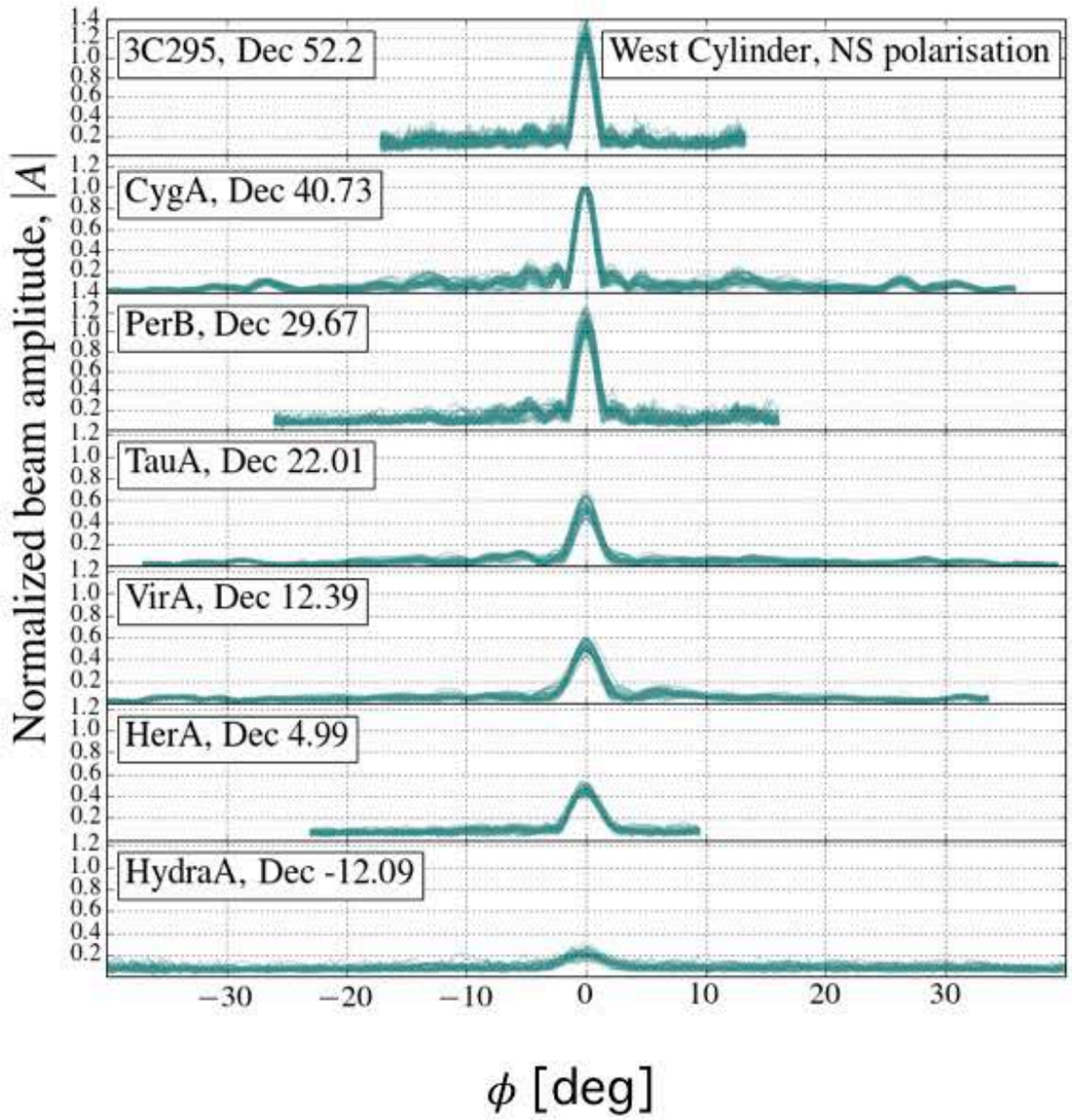


Holographic beam scans from multiple sources





Berger et al 2016



CHIME - it lives!