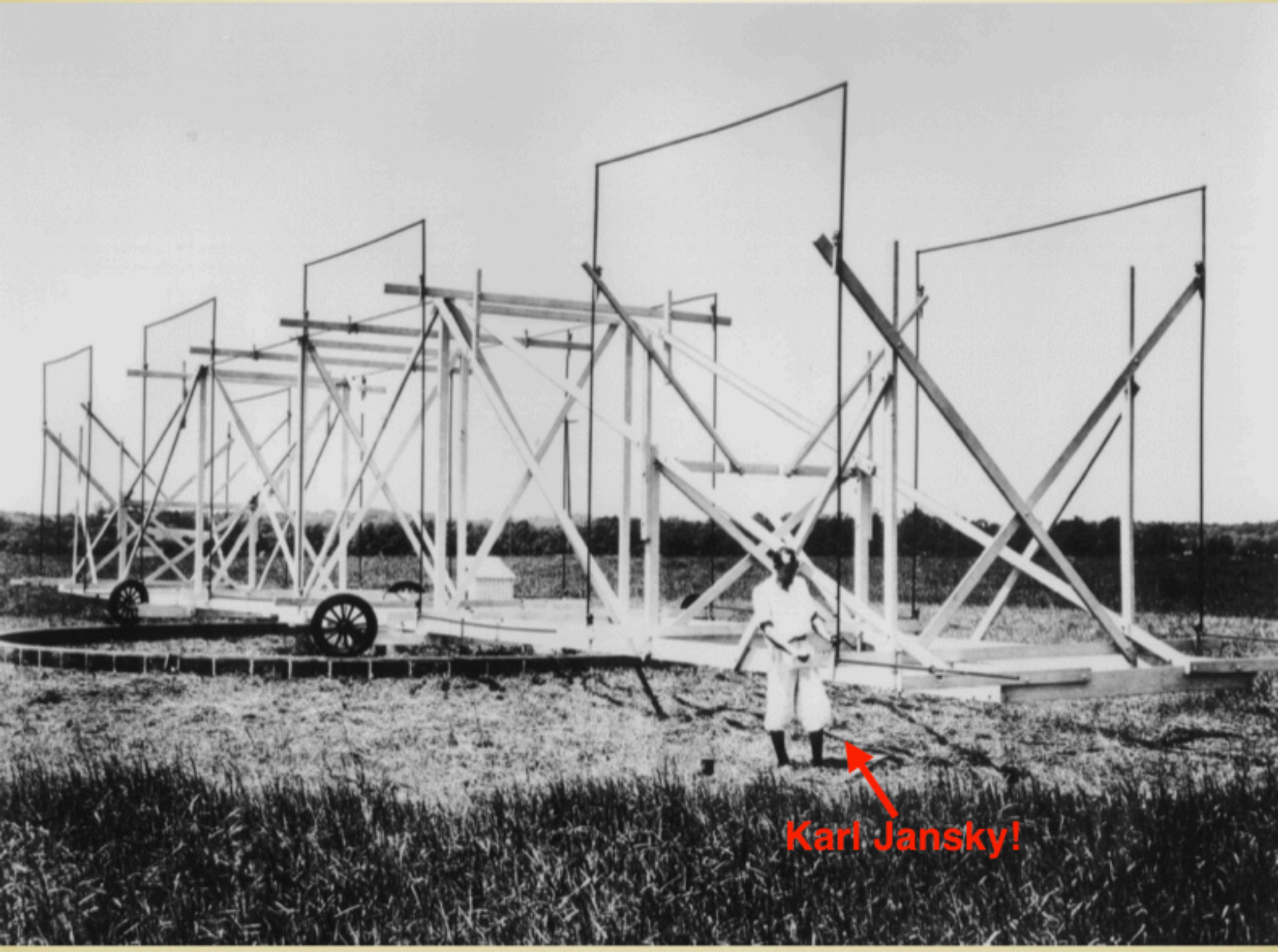
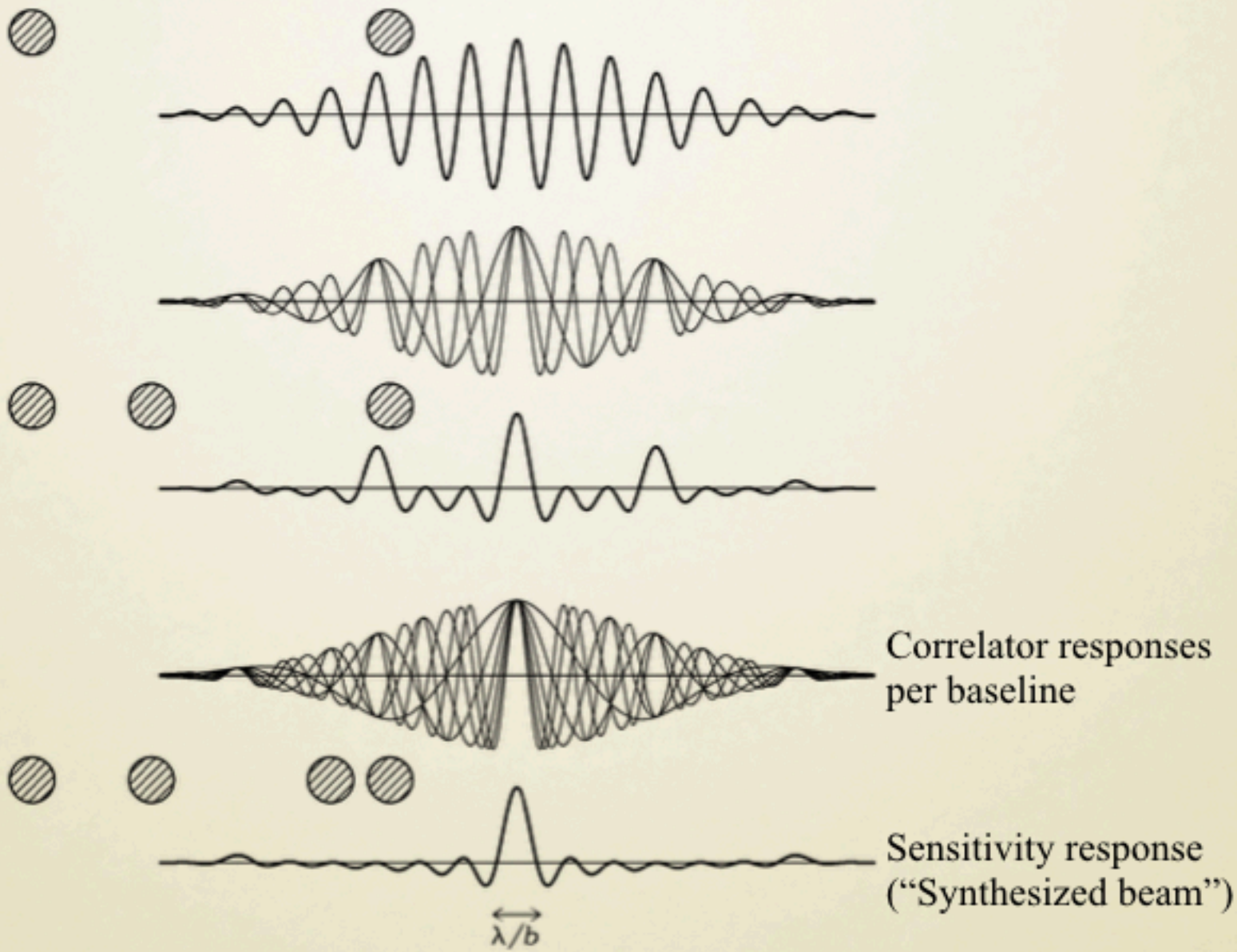
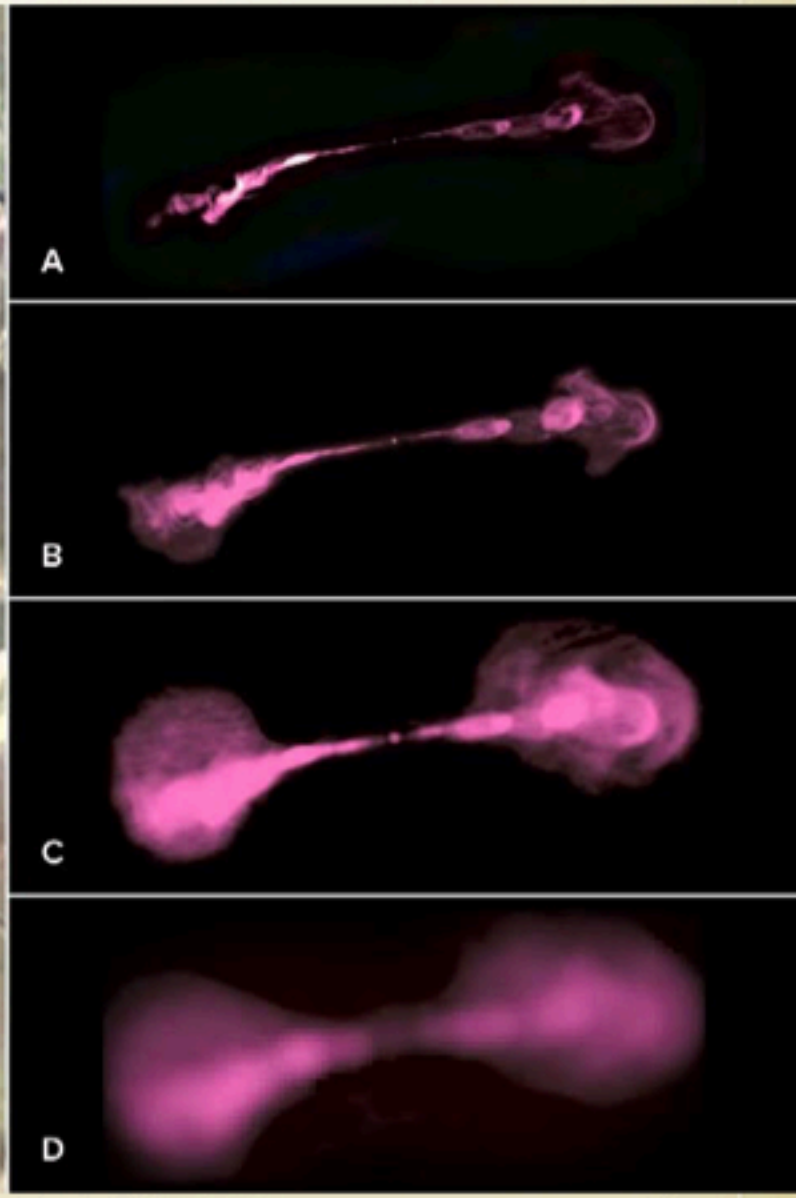

Karl Jansky!

ERA figure 3.42



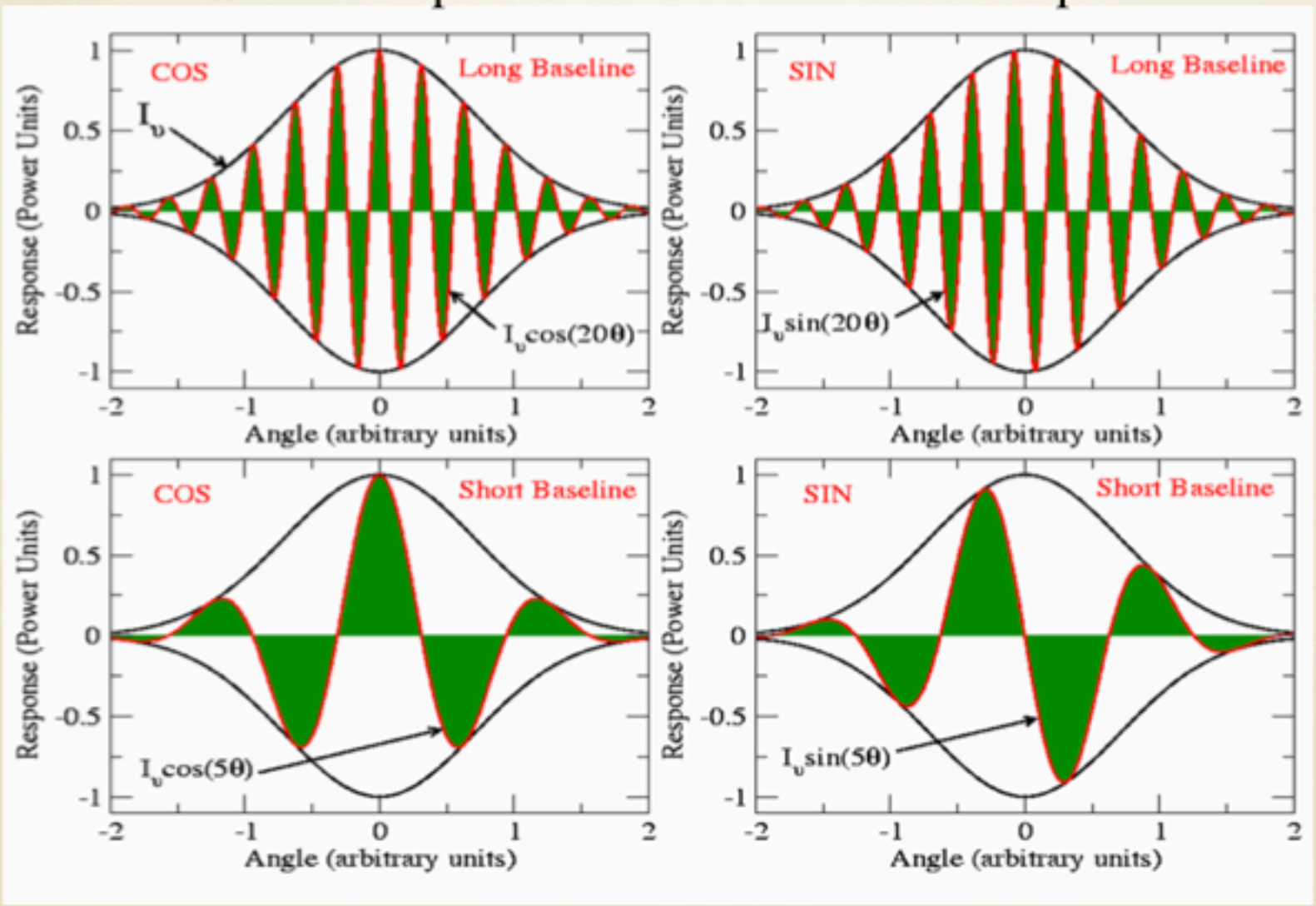

A
B
C
D


A
B
C
D

Visualizing visibilities

Cosine response

Sine response



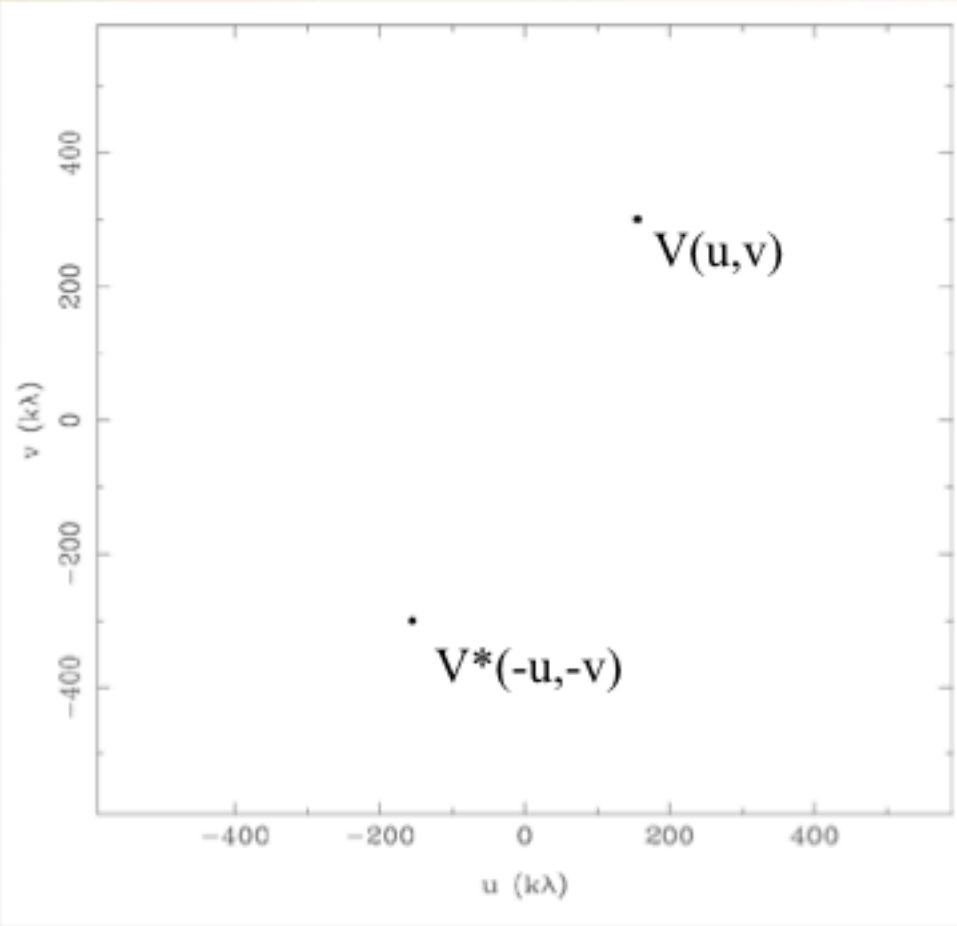
Long baseline

Short baseline

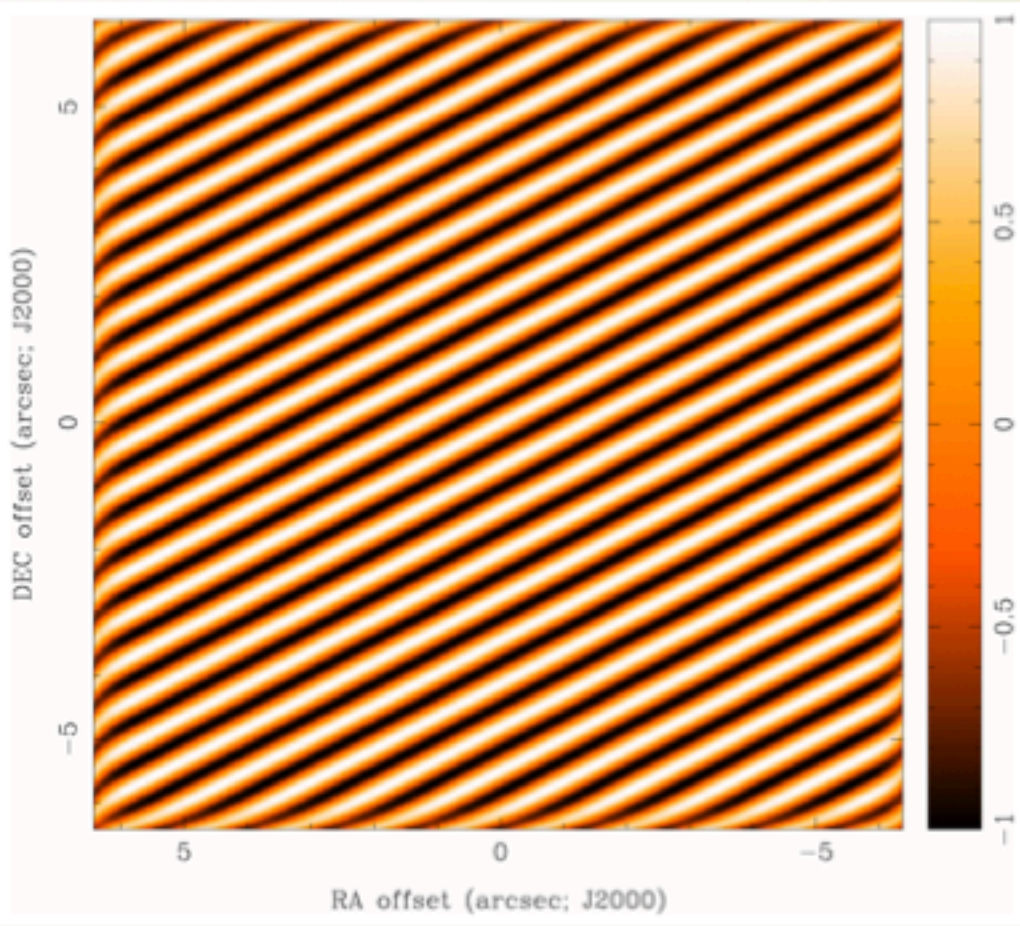
“Dirty beam” (synthesized beam) in 2D

[no amplitude or phase info from real source]

Number of antennae: 2



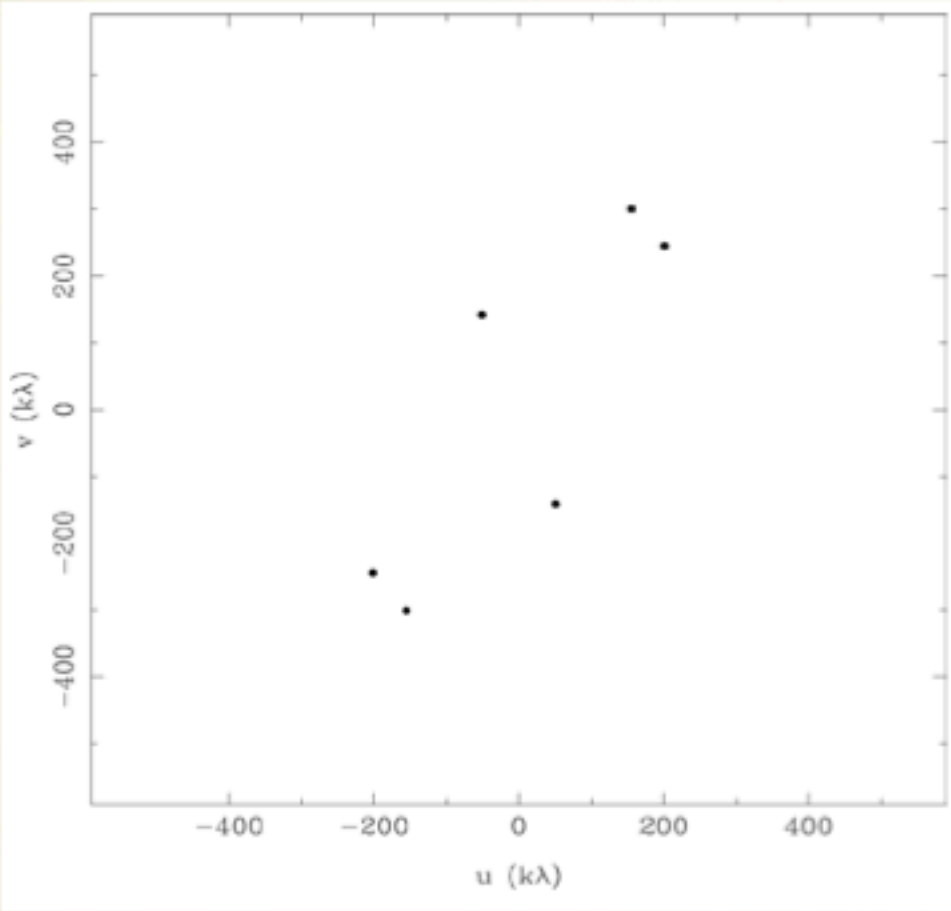
u,v plane



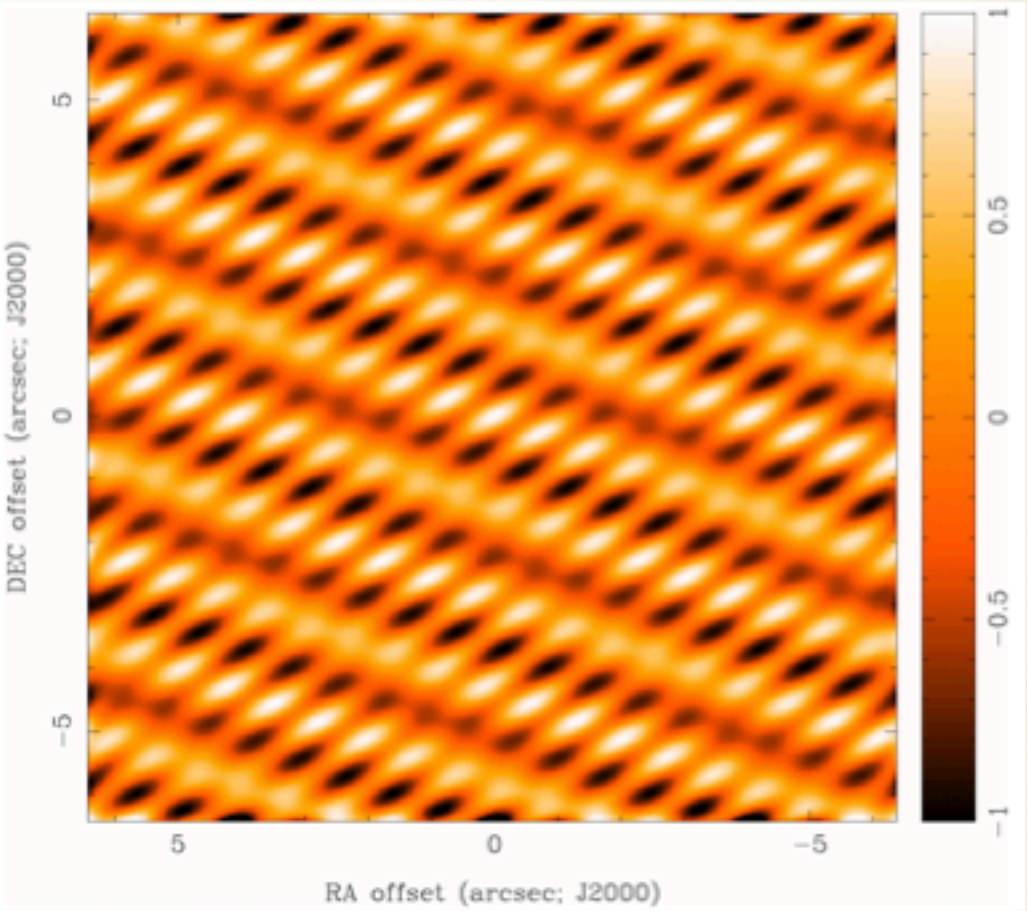
Point spread function of synthesized beam

“Dirty beam” (synthesized beam) in 2D

Number of antennae: 3



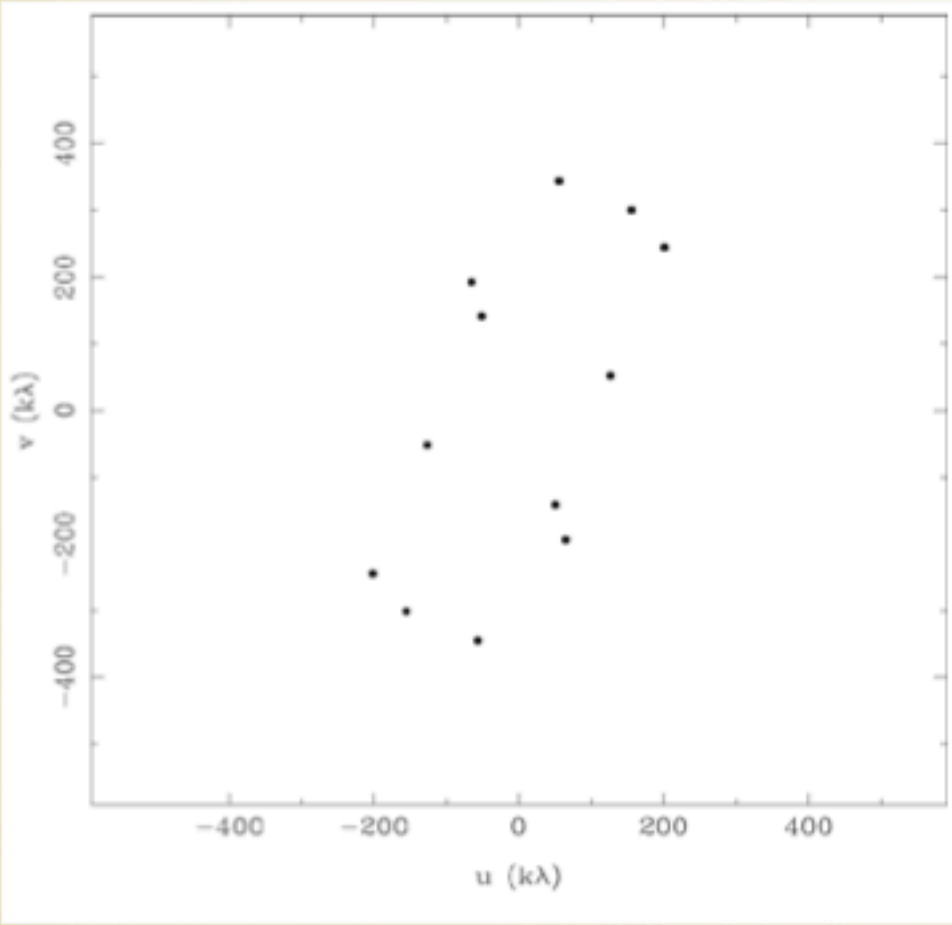
u,v plane



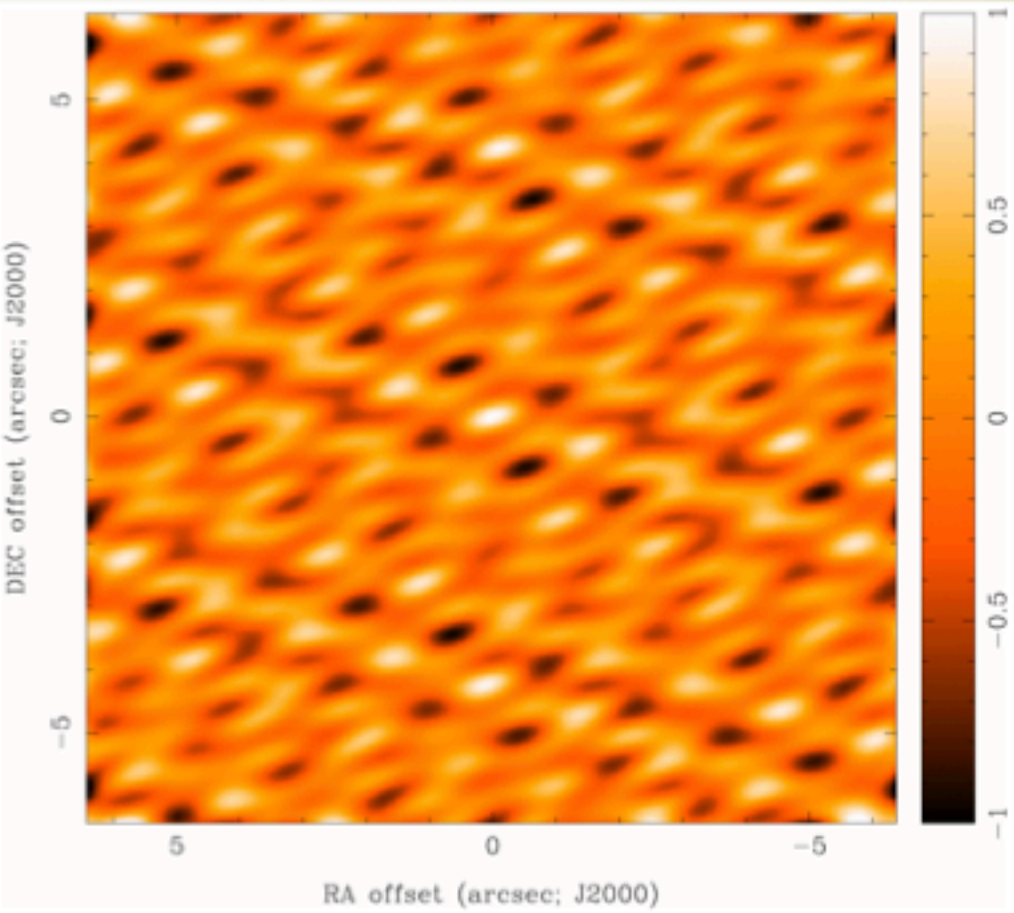
Point spread function of synthesized beam

“Dirty beam” (synthesized beam) in 2D

Number of antennae: 4



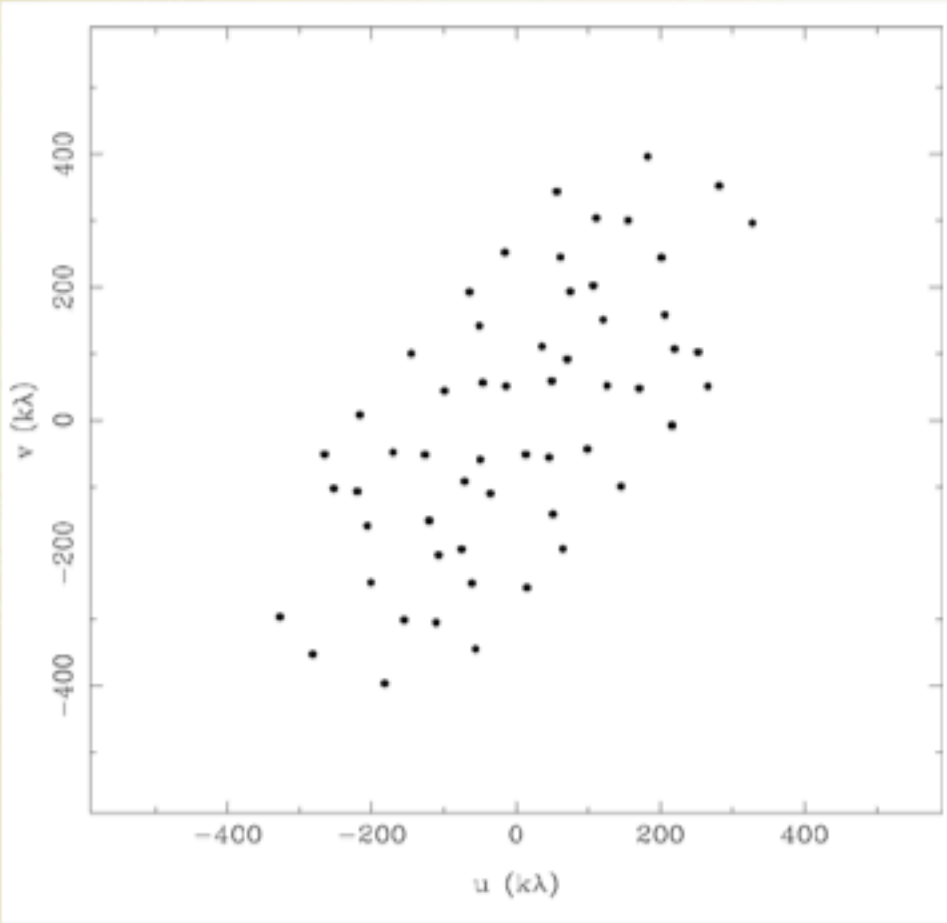
u,v plane



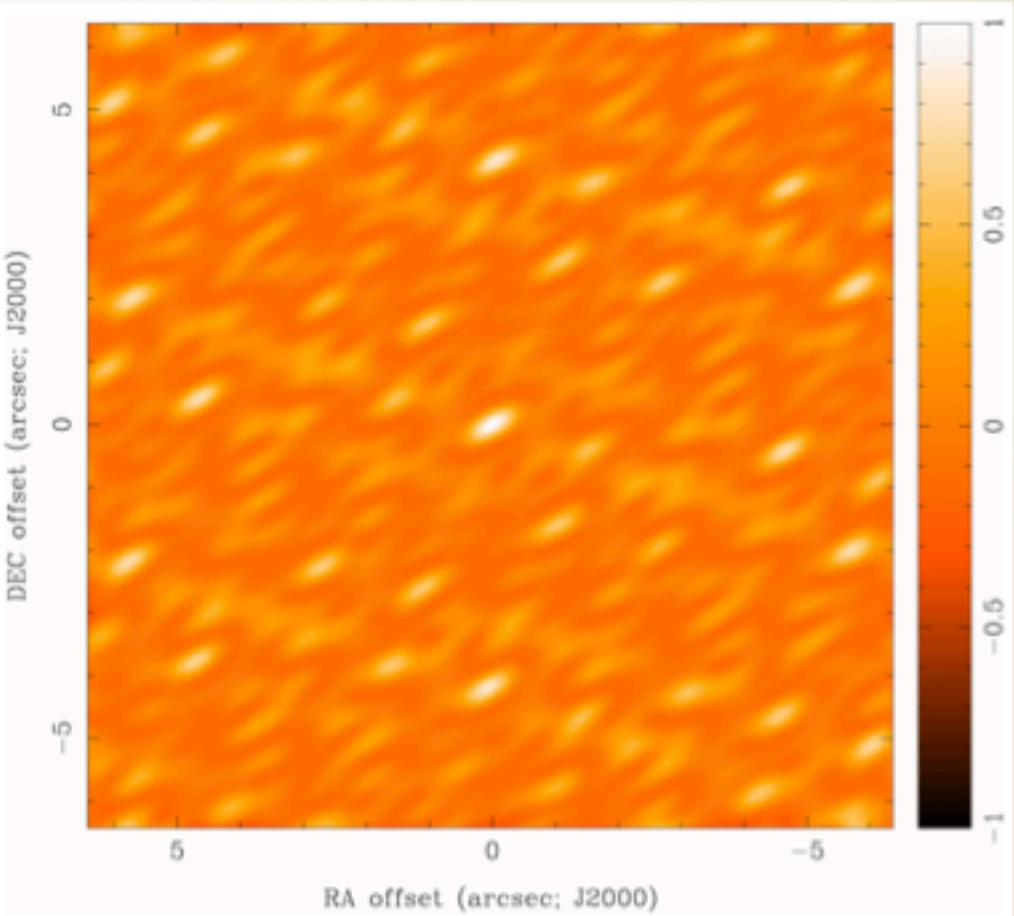
Point spread function of synthesized beam

“Dirty beam” (synthesized beam) in 2D

Number of antennae: 8



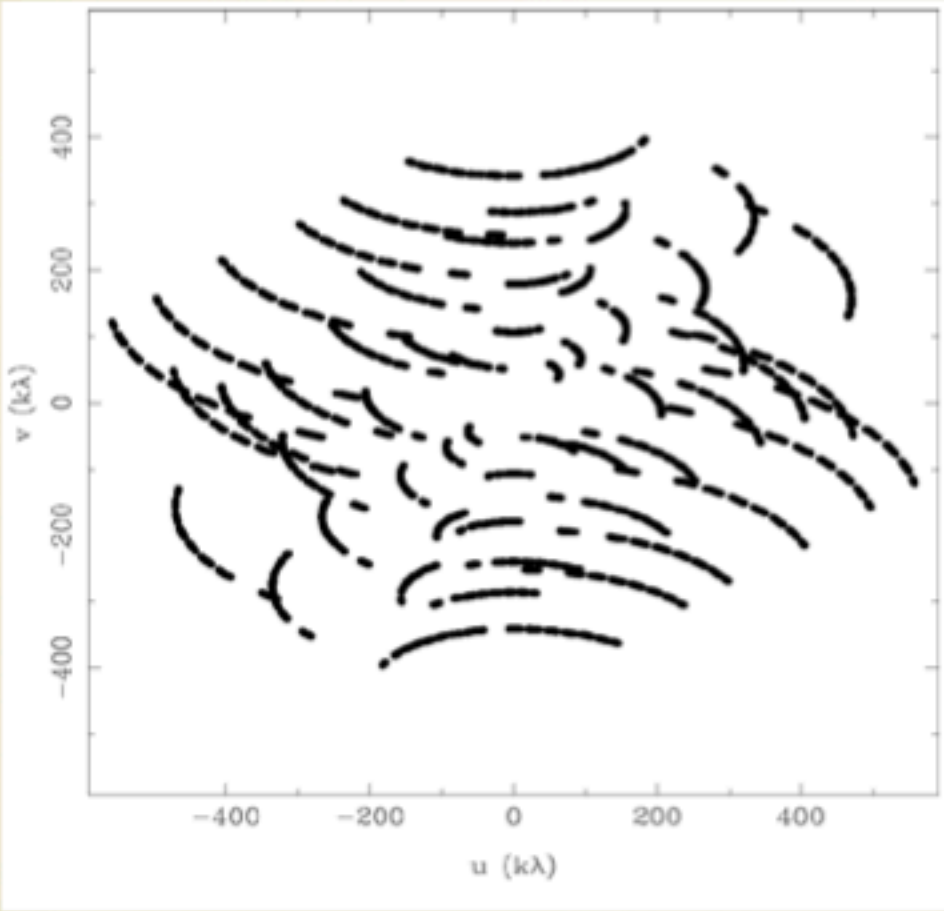
u,v plane



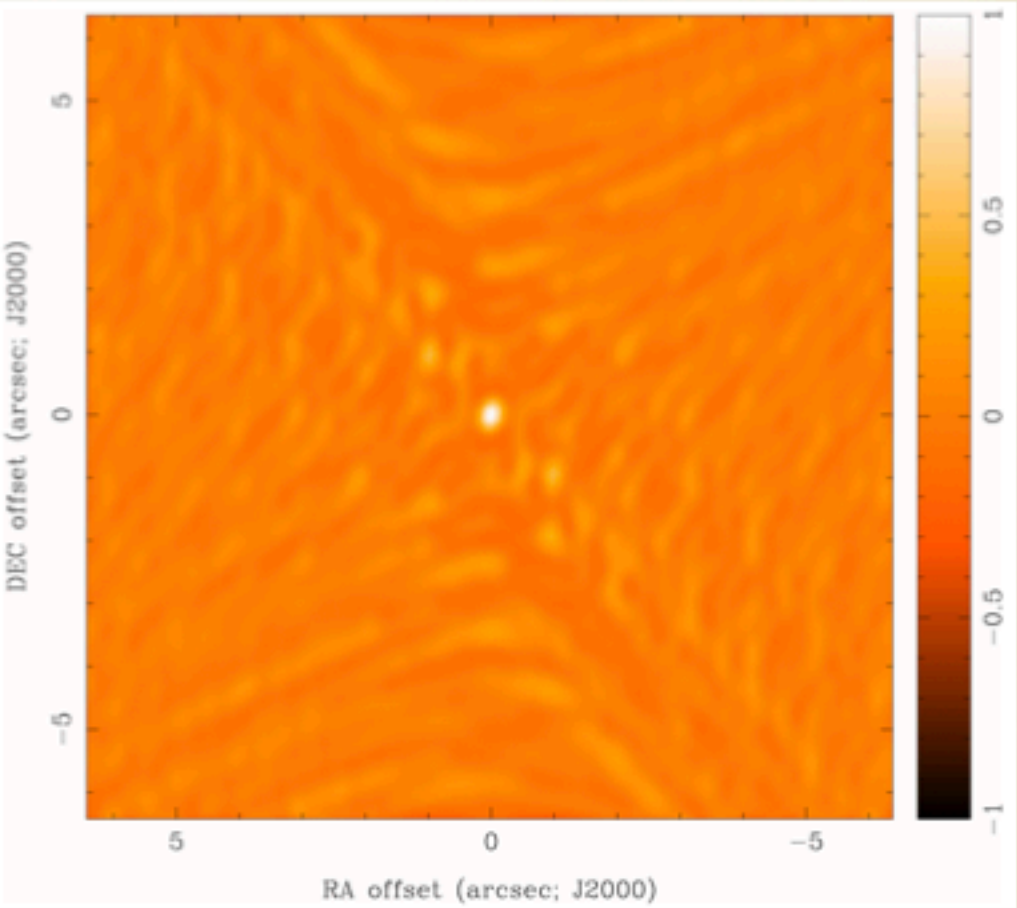
Point spread function of synthesized beam

“Dirty beam” (synthesized beam) in 2D

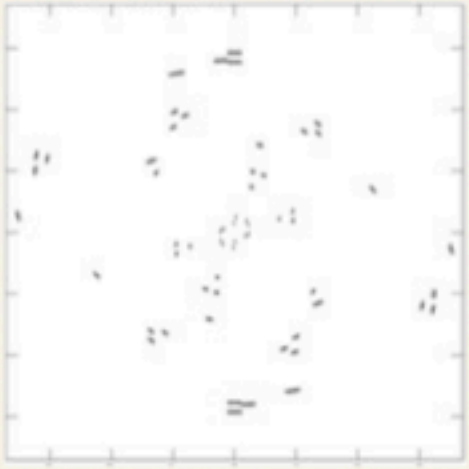
Number of antennae: 8; Track source for 7 hours



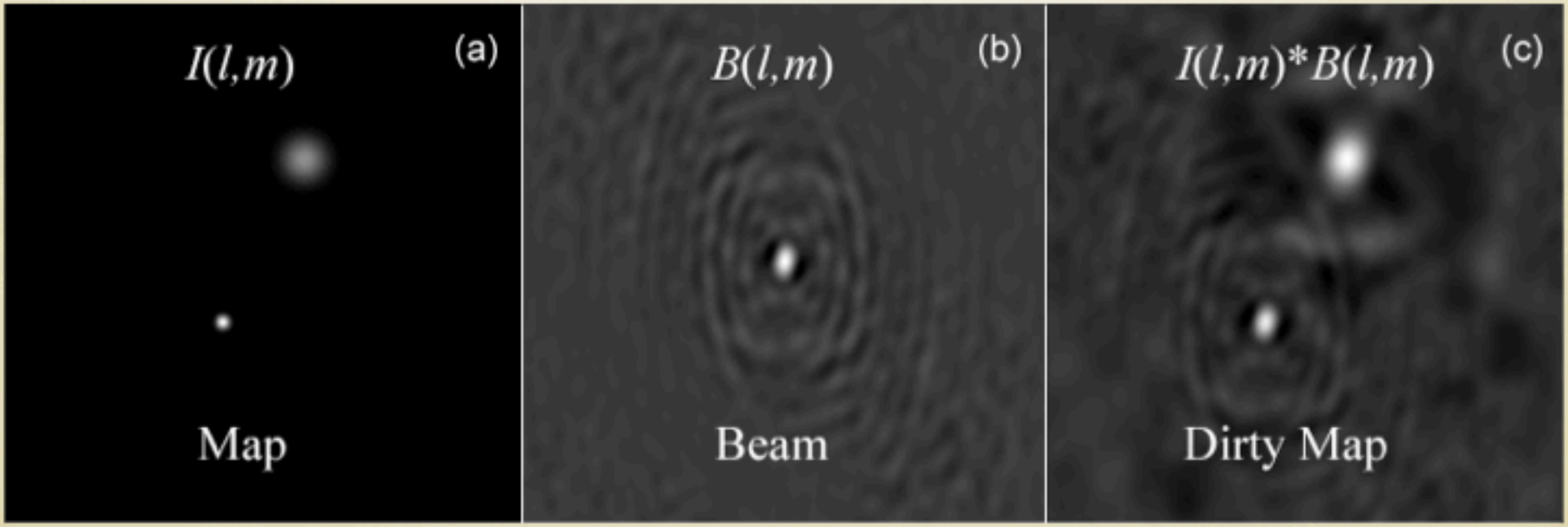
u,v plane



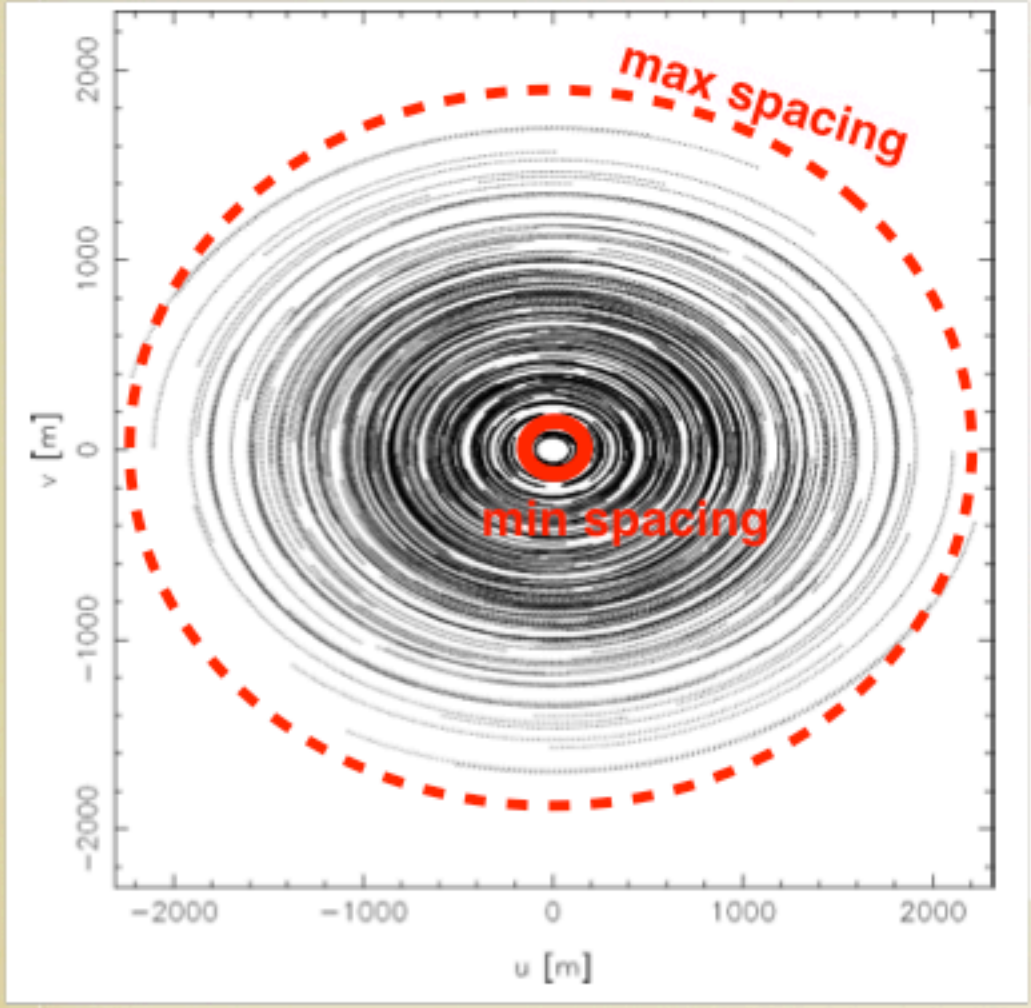
Point spread function of synthesized beam

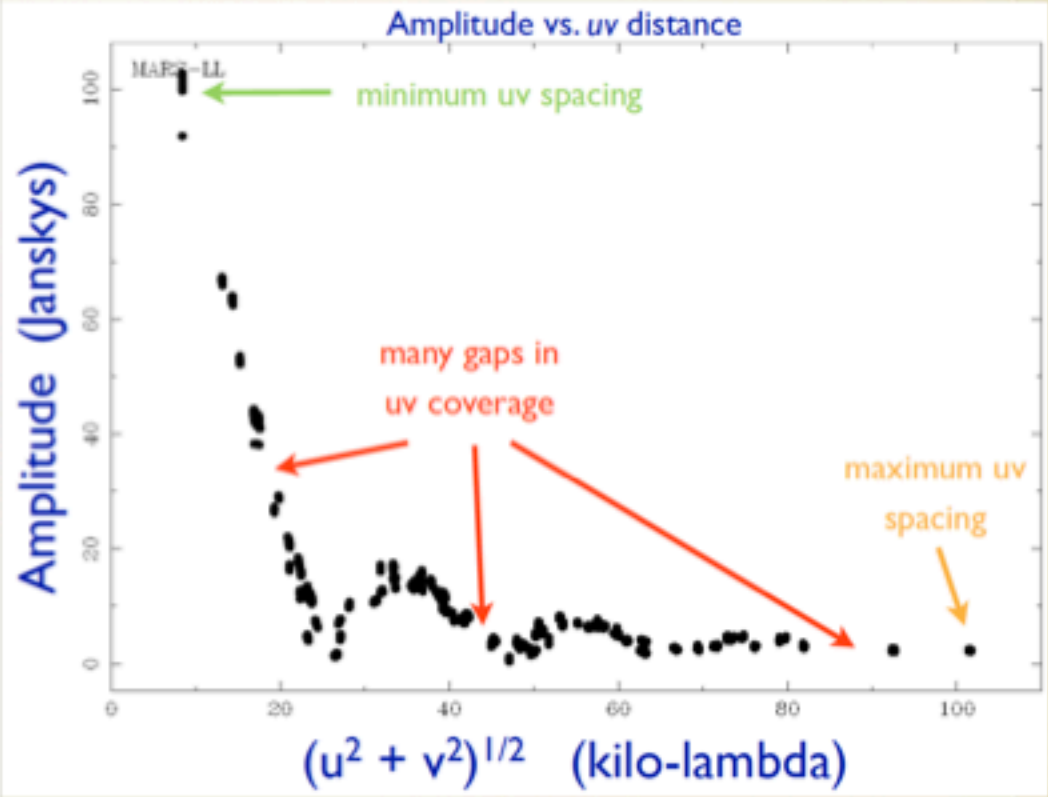


Actual Sky | Synthesized ("dirty") Beam | "Dirty map"



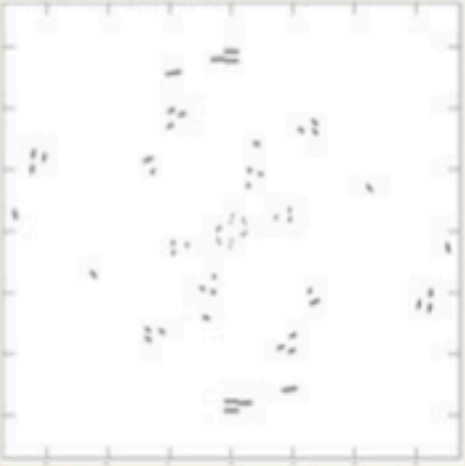
u,v distance and sparse sampling

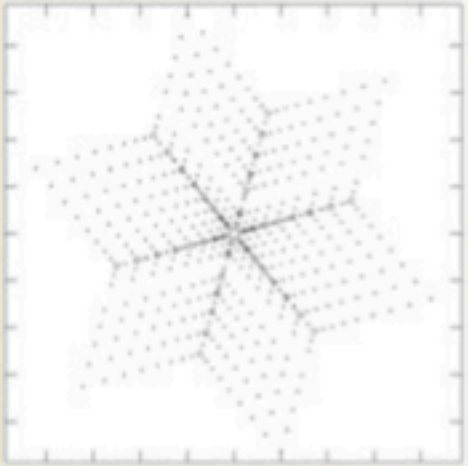




(Projected baseline, B)

A kid game for PhD students…

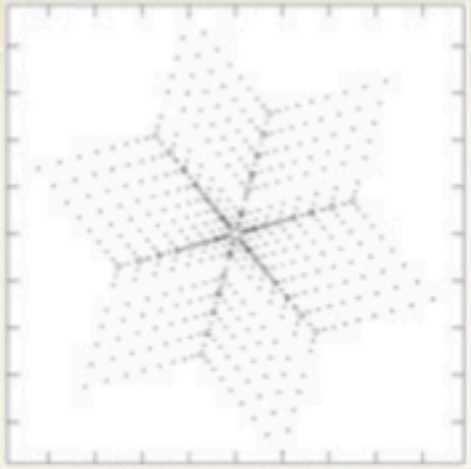


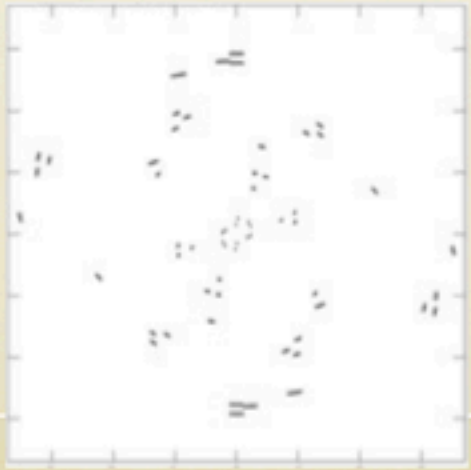


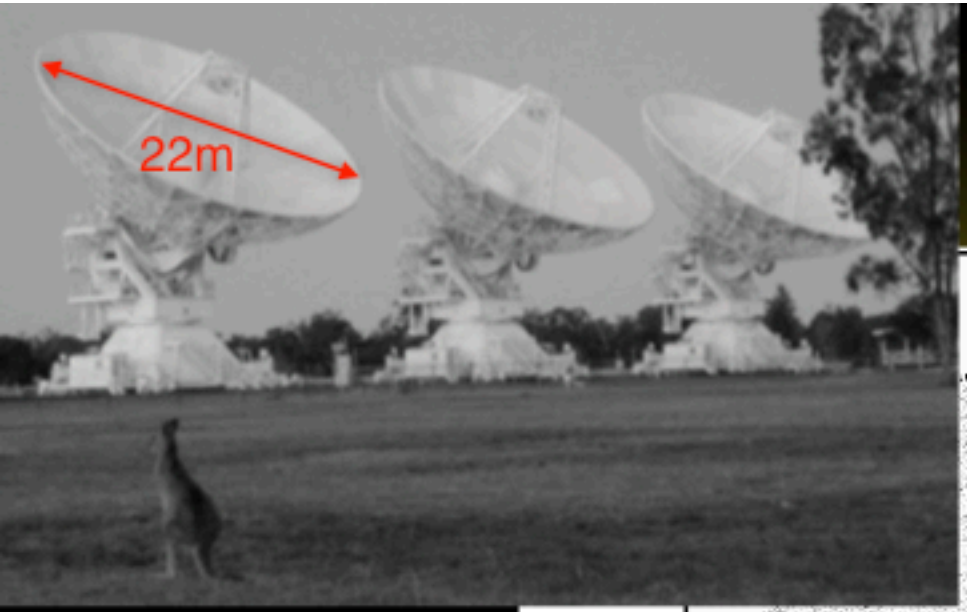
(note, this one has observed for a few minutes, not a snapshot)

Which "snapshot observation" u,v plane goes to which telescope?

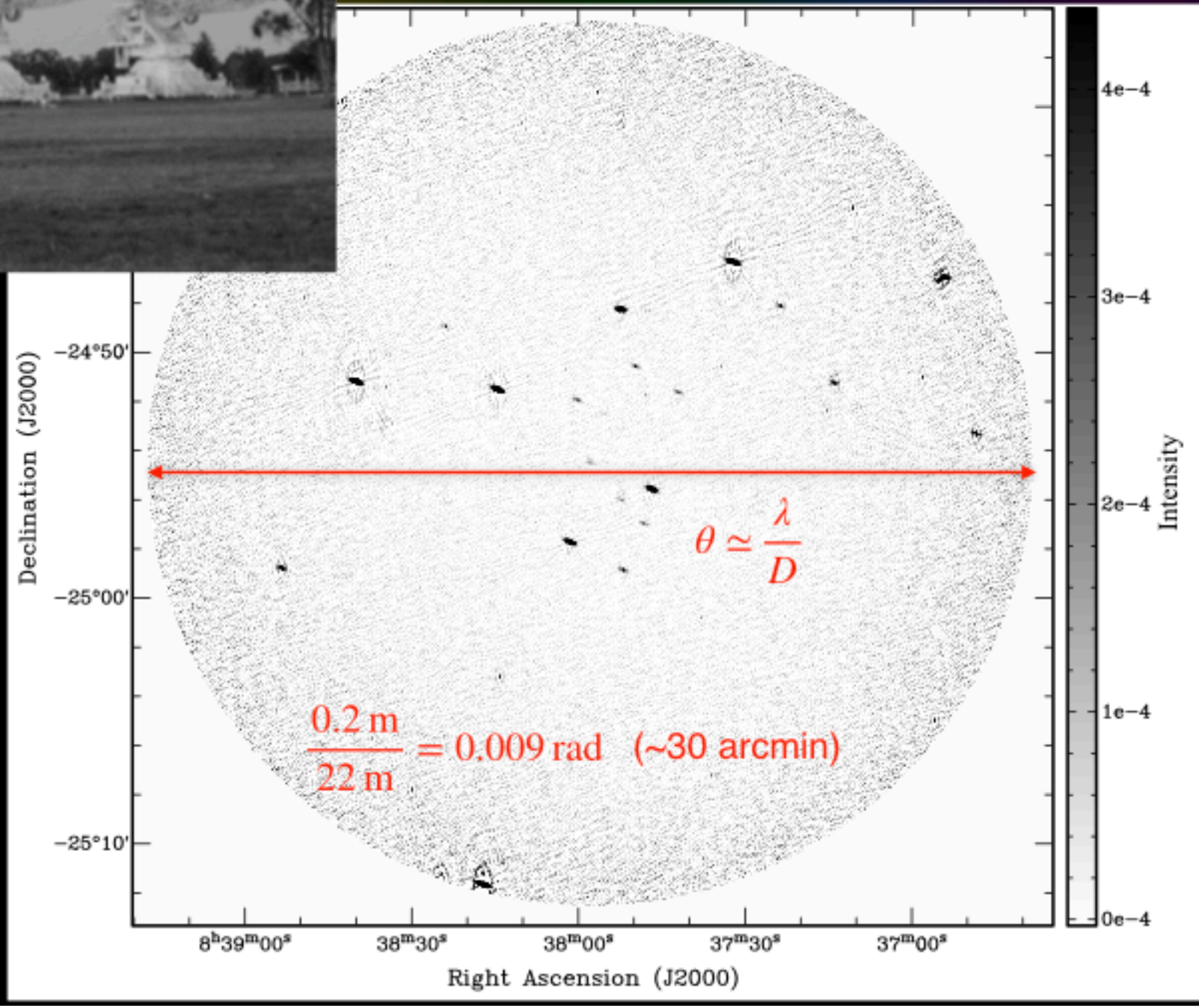
In the right order…





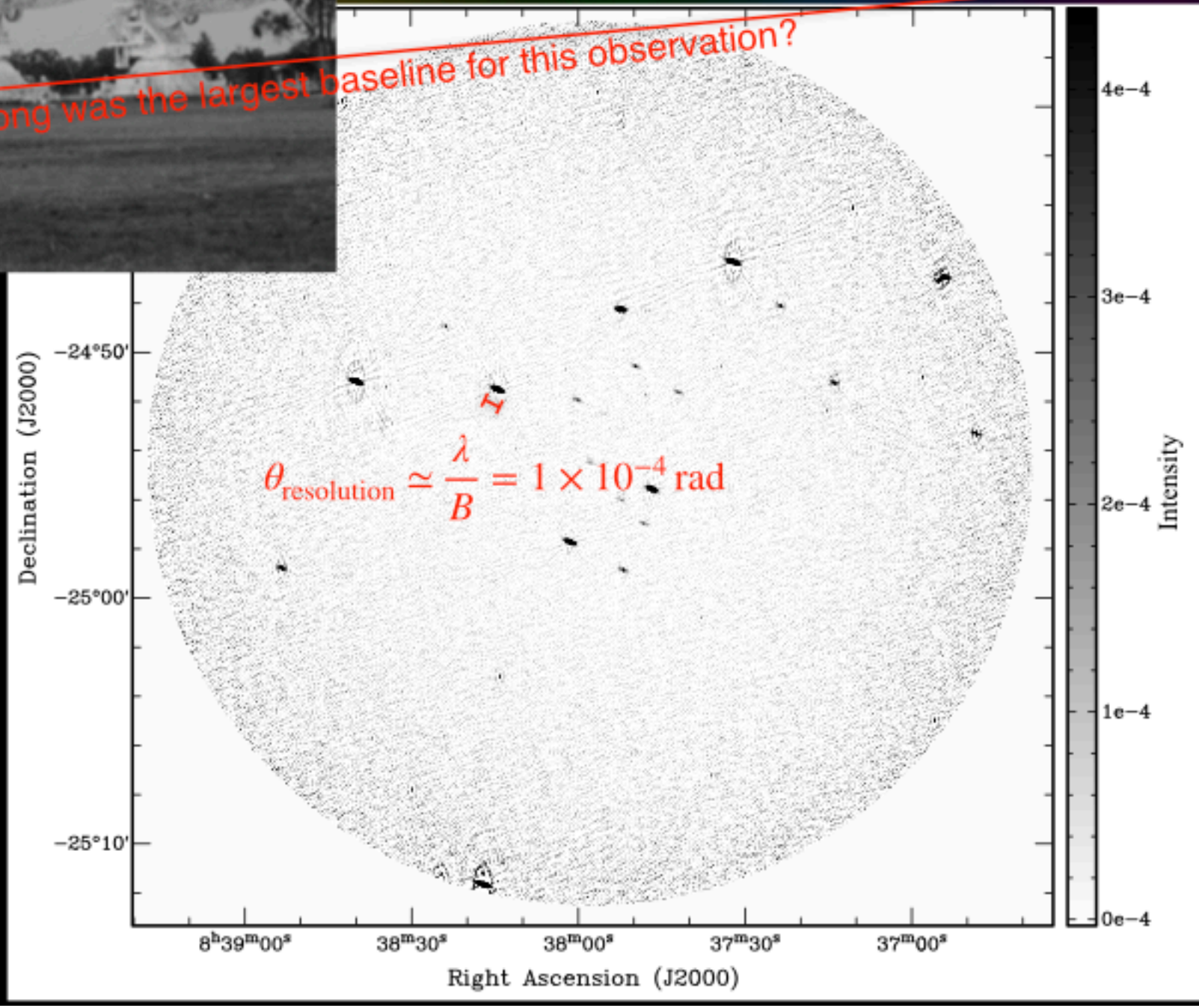


1.5 GHz (20cm) image from Australia Telescope Compact Array



1.5 GHz (20cm) image from Australia Telescope Compact Array

How long was the largest baseline for this observation?



$$\theta_{\text{resolution}} \simeq \frac{\lambda}{B} = 1 \times 10^{-4}\ \text{rad}$$