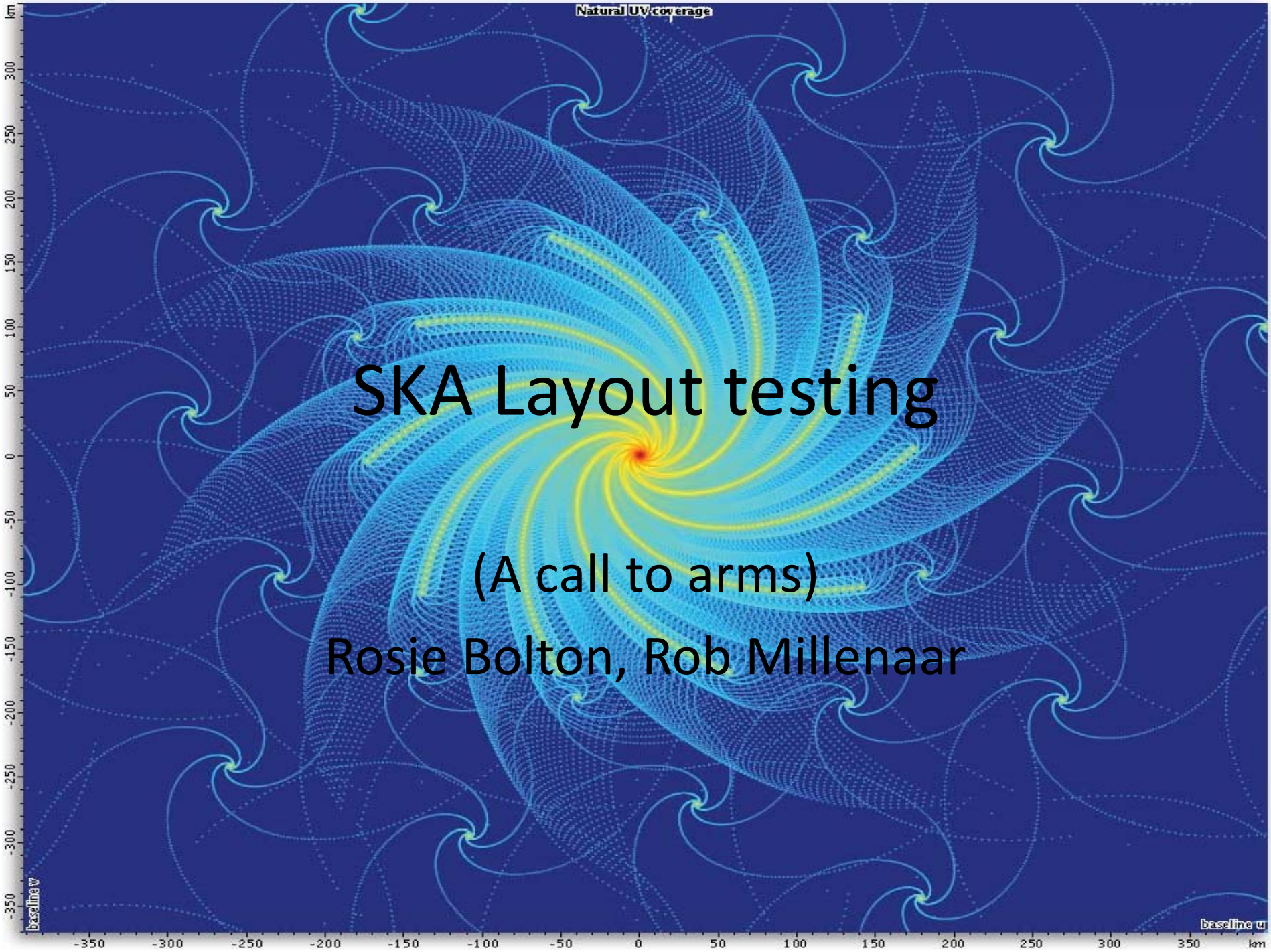
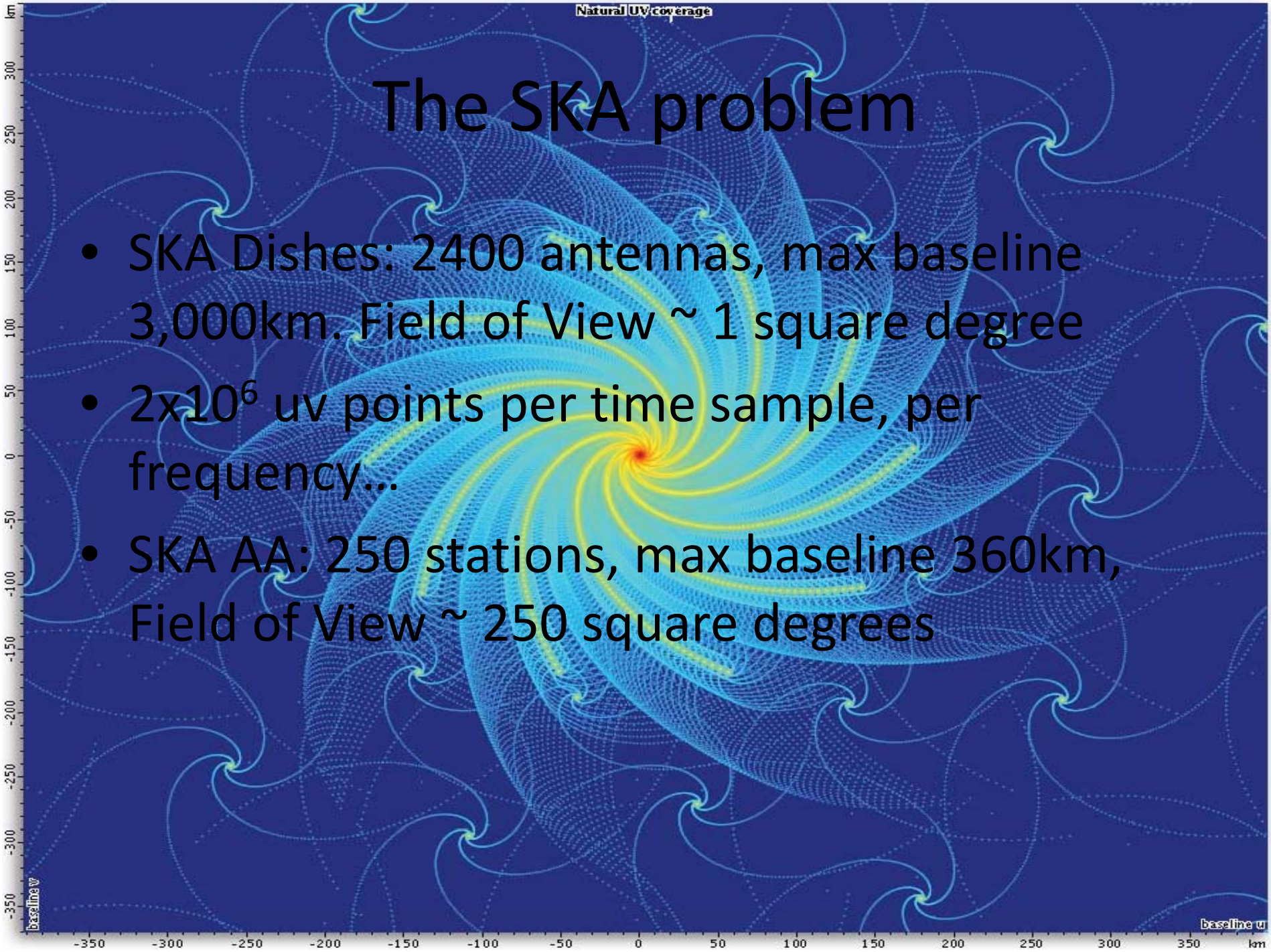


SKA Layout testing

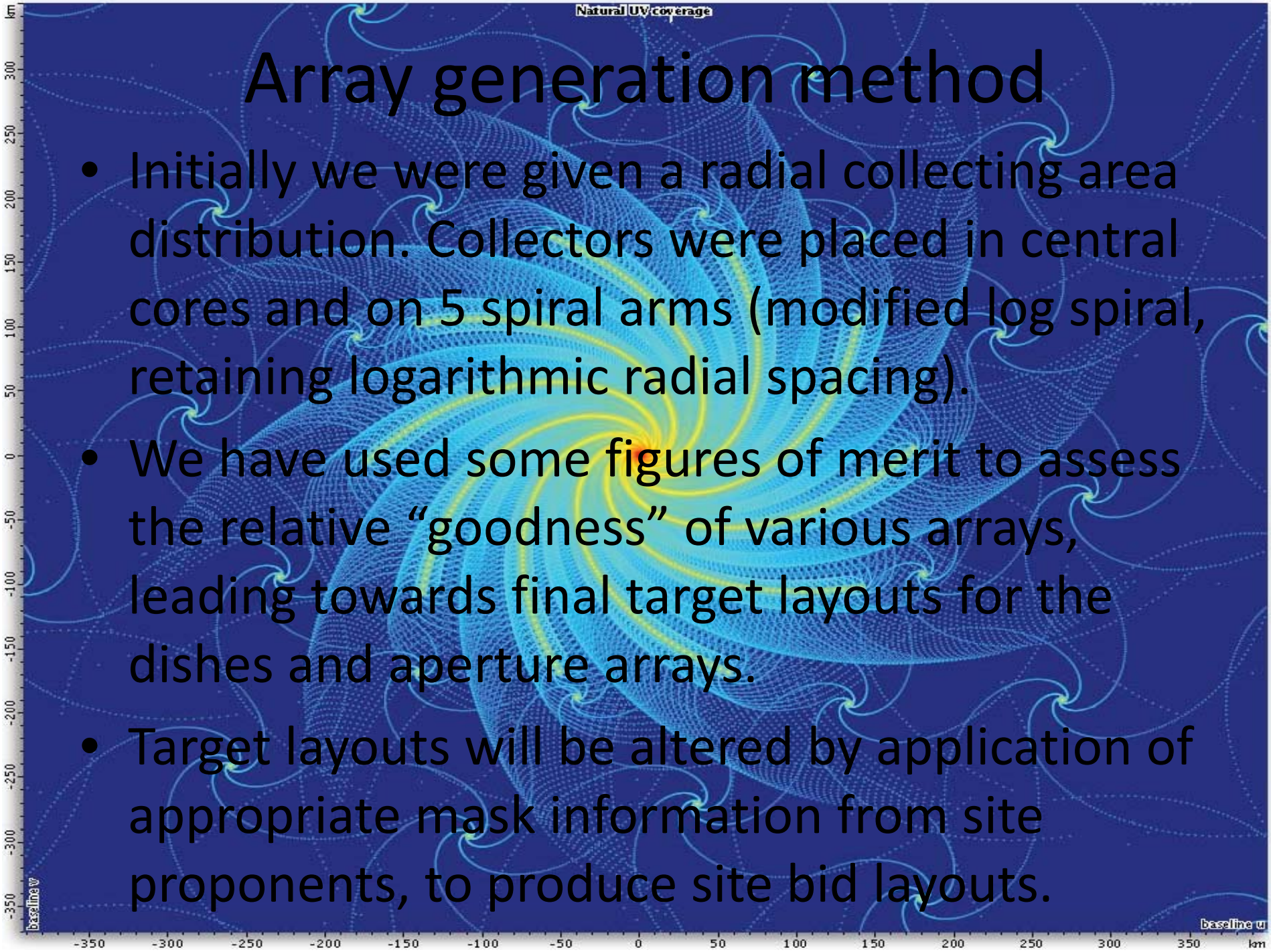
(A call to arms)

Rosie Bolton, Rob Millenaar



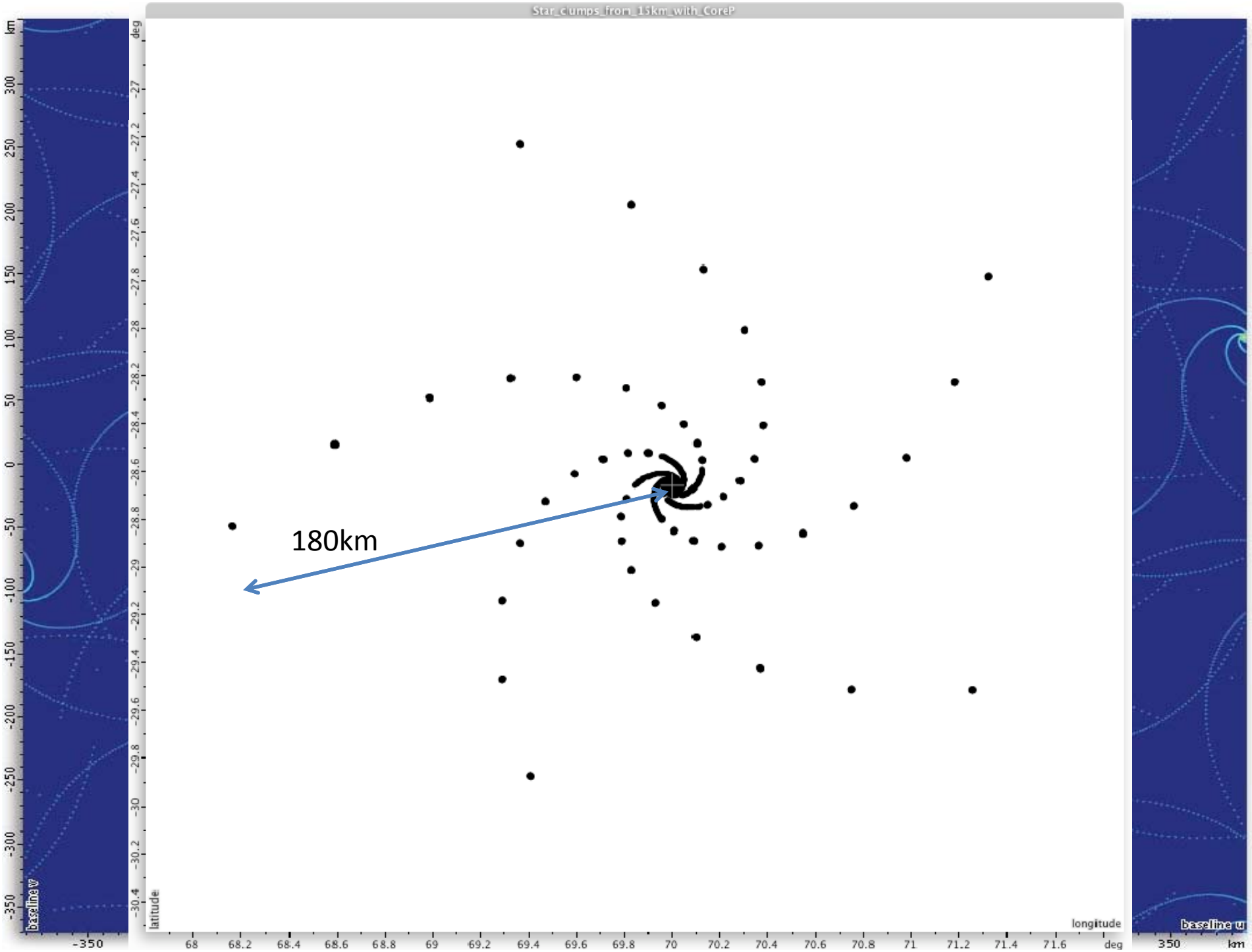
The SKA problem

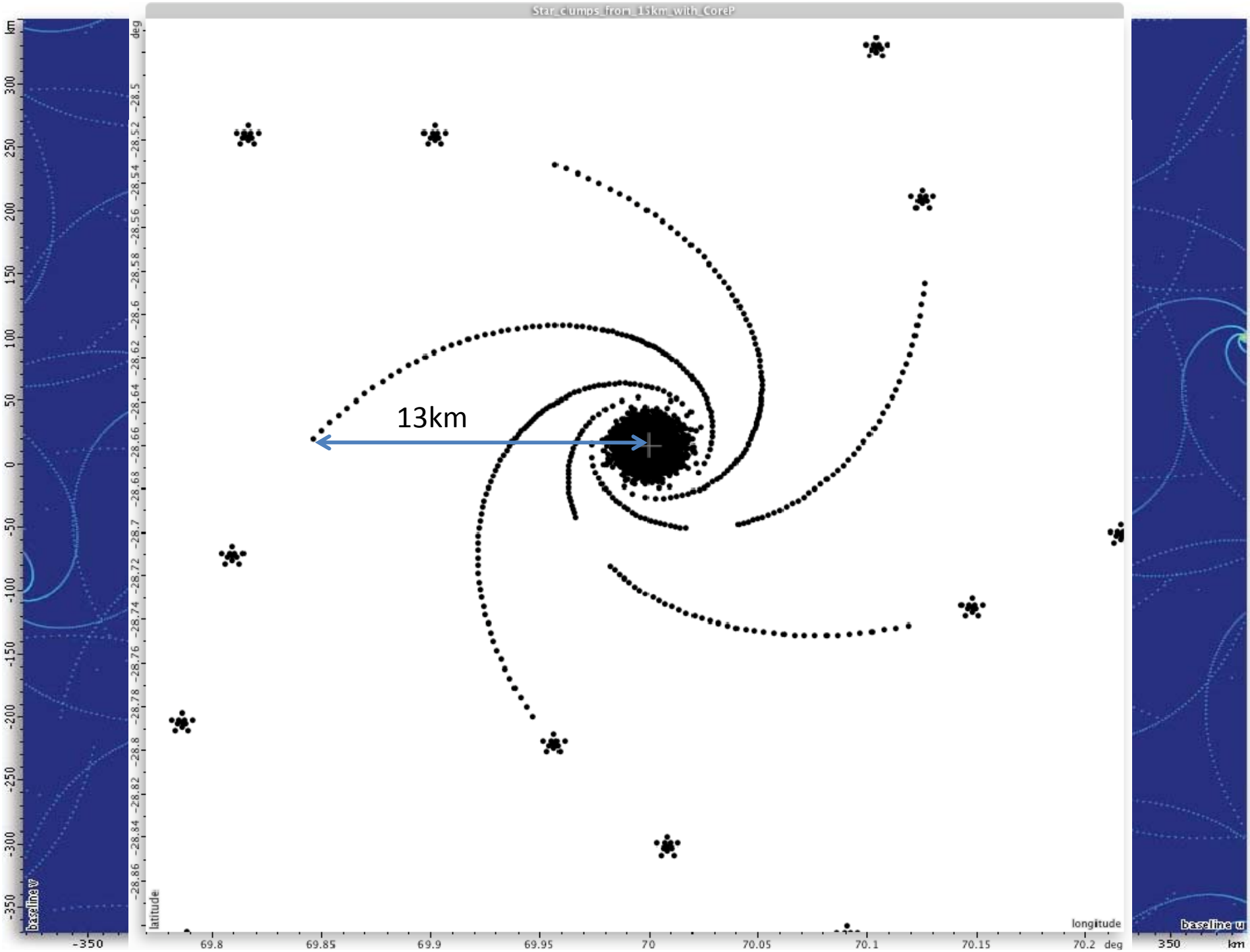
- SKA Dishes: 2400 antennas, max baseline 3,000km. Field of View ~ 1 square degree
- $2x10^6$ uv points per time sample, per frequency…
- SKA AA: 250 stations, max baseline 360km, Field of View ~ 250 square degrees

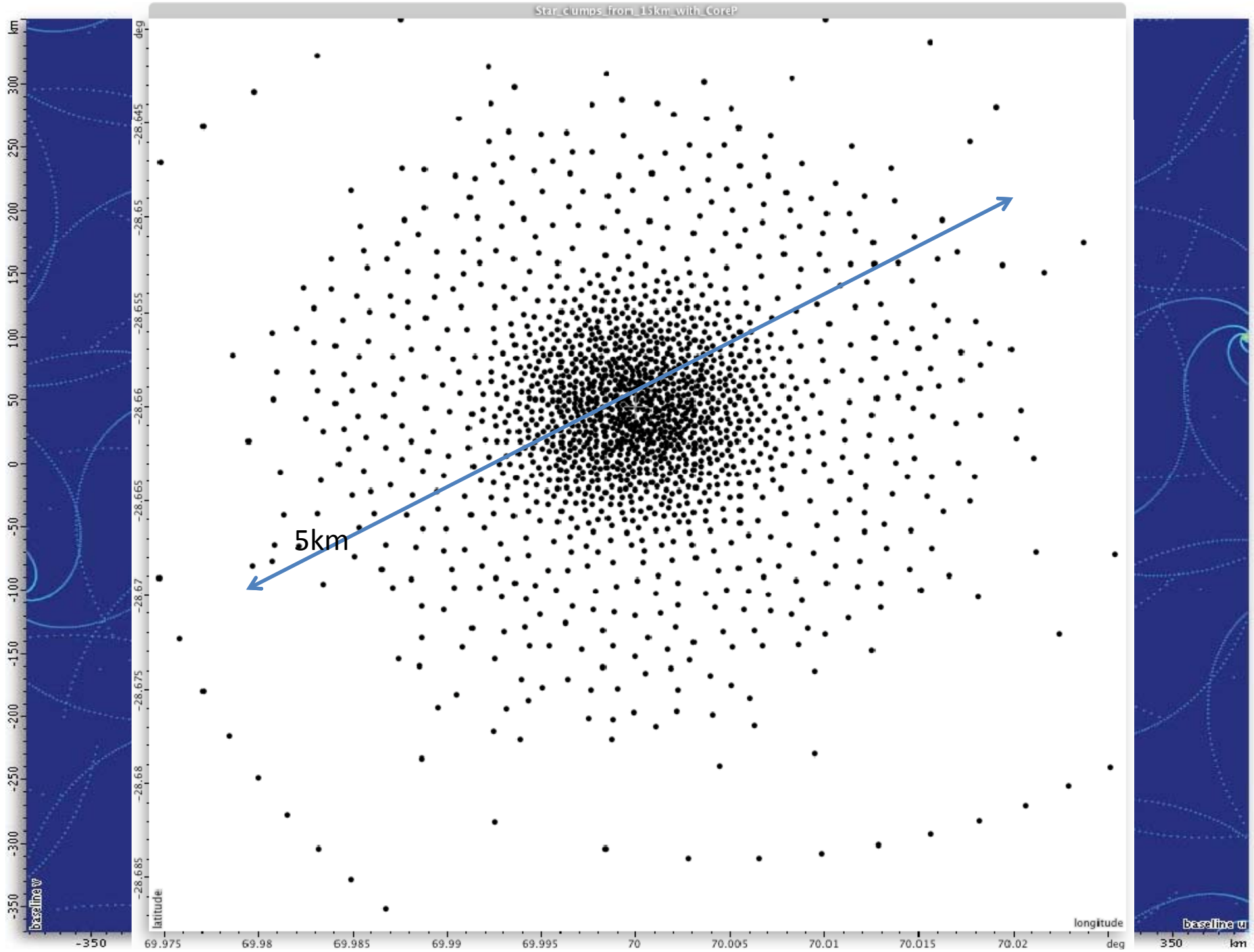


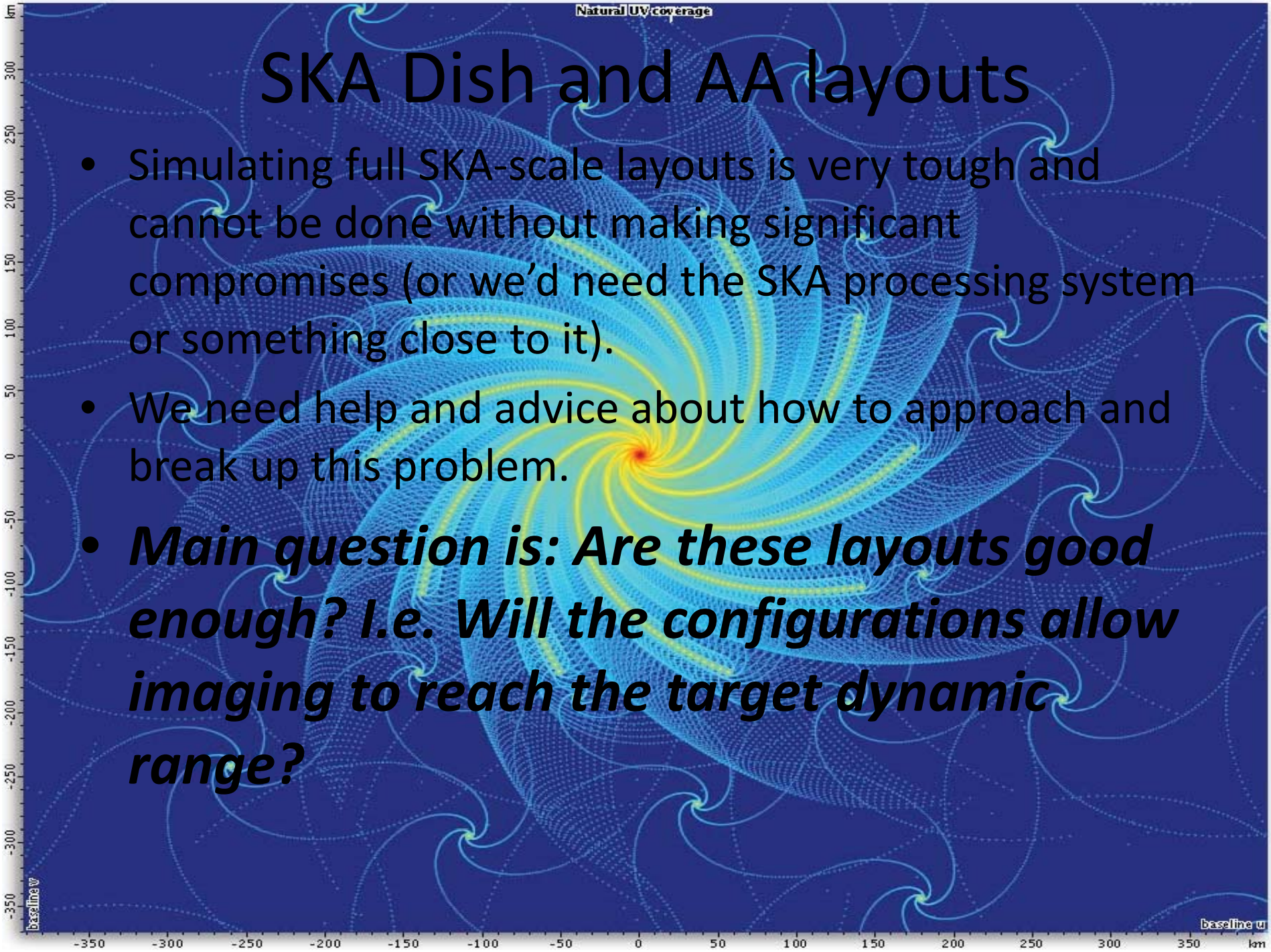
Array generation method

- Initially we were given a radial collecting area distribution. Collectors were placed in central cores and on 5 spiral arms (modified log spiral, retaining logarithmic radial spacing).
- We have used some figures of merit to assess the relative “goodness” of various arrays, leading towards final target layouts for the dishes and aperture arrays.
- Target layouts will be altered by application of appropriate mask information from site proponents, to produce site bid layouts.


Star_cumps_from_15km_with_CoreP
180km
km
deg
latitude
longitude
baseline v
baseline u
-350
350
68
68.2
68.4
68.6
68.8
69
69.2
69.4
69.6
69.8
70
70.2
70.4
70.6
70.8
71
71.2
71.4
71.6
deg
-27
-27.2
-27.4
-27.6
-27.8
-28
-28.2
-28.4
-28.6
-28.8
-29
-29.2
-29.4
-29.6
-29.8
-30
-30.2
-30.4
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
-350


Star_cumps_from_15km_with_CoreP
13km
baseline v
km
-350
baseline u
350
km
latitude
deg
-28.5
-28.52
-28.54
-28.56
-28.58
-28.6
-28.62
-28.64
-28.66
-28.68
-28.7
-28.72
-28.74
-28.76
-28.78
-28.8
-28.82
-28.84
-28.86
longitude
69.8
69.85
69.9
69.95
70
70.05
70.1
70.15
70.2
deg


Star_cumps_from_15km_with_CoreP
5km
km
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
-350
baseline v
-350
deg
-28.645
-28.65
-28.655
-28.66
-28.665
-28.67
-28.675
-28.68
-28.685
latitude
69.975
69.98
69.985
69.99
69.995
70
70.005
70.01
70.015
70.02
deg
longitude
baseline u
350
km



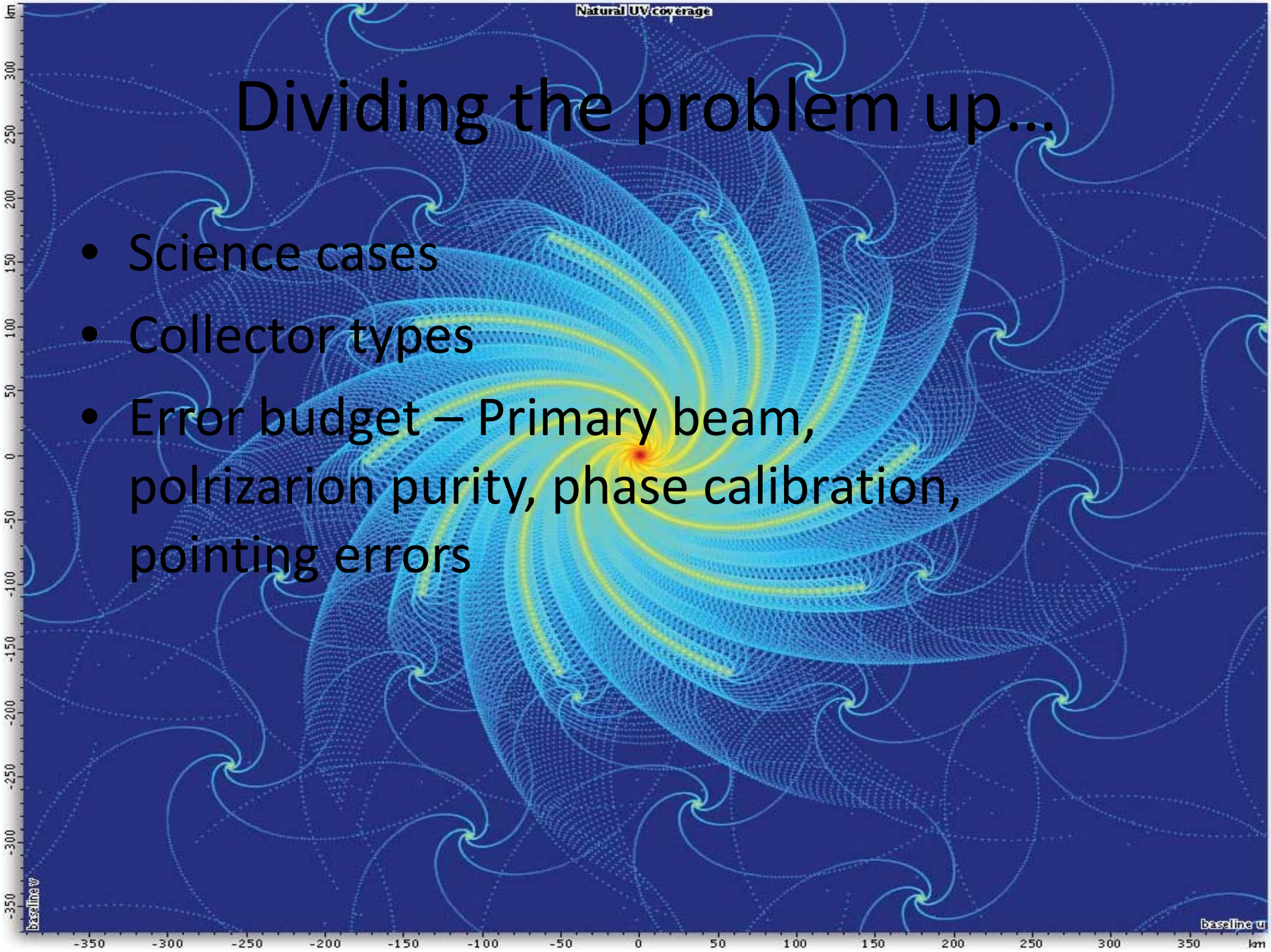
SKA Dish and AA layouts

- Simulating full SKA-scale layouts is very tough and cannot be done without making significant compromises (or we'd need the SKA processing system or something close to it).
- We need help and advice about how to approach and break up this problem.
- ***Main question is: Are these layouts good enough? I.e. Will the configurations allow imaging to reach the target dynamic range?***

SKA Simulations

- Is anyone here brave / talented* enough to help?
- Discussion session tomorrow is a chance for informal input, anyone with interest and time is welcome to contribute to the longer-term programme.
- Rosie Bolton rosie@mrao.cam.ac.uk
- Rob Millenaar millenaar@skatelescope.org

* Flattery *will* get you everywhere…



Dividing the problem up…

- Science cases
- Collector types
- Error budget – Primary beam, polrizarion purity, phase calibration, pointing errors