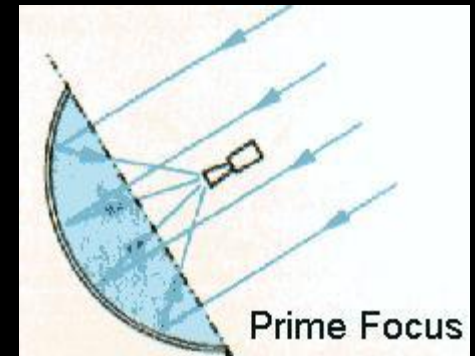
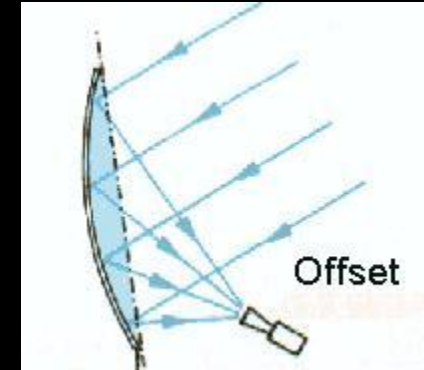


Pro and contra offset dish

- + **no (or less) blocking by the feed,**
less interaction between feed and reflector,
less diffused radiation
- + **feed tilted upwards**
→ less ground noise pickup from spillover
- + **easy access to the feed**
- **reflector construction more difficult**
- **5% to 10% more reflector surface**



Pro and contra offset dish

Small offset dish (up to 3m)

- + less blocking by the feed
- + less ground noise

Large offset dish

- + less ground noise

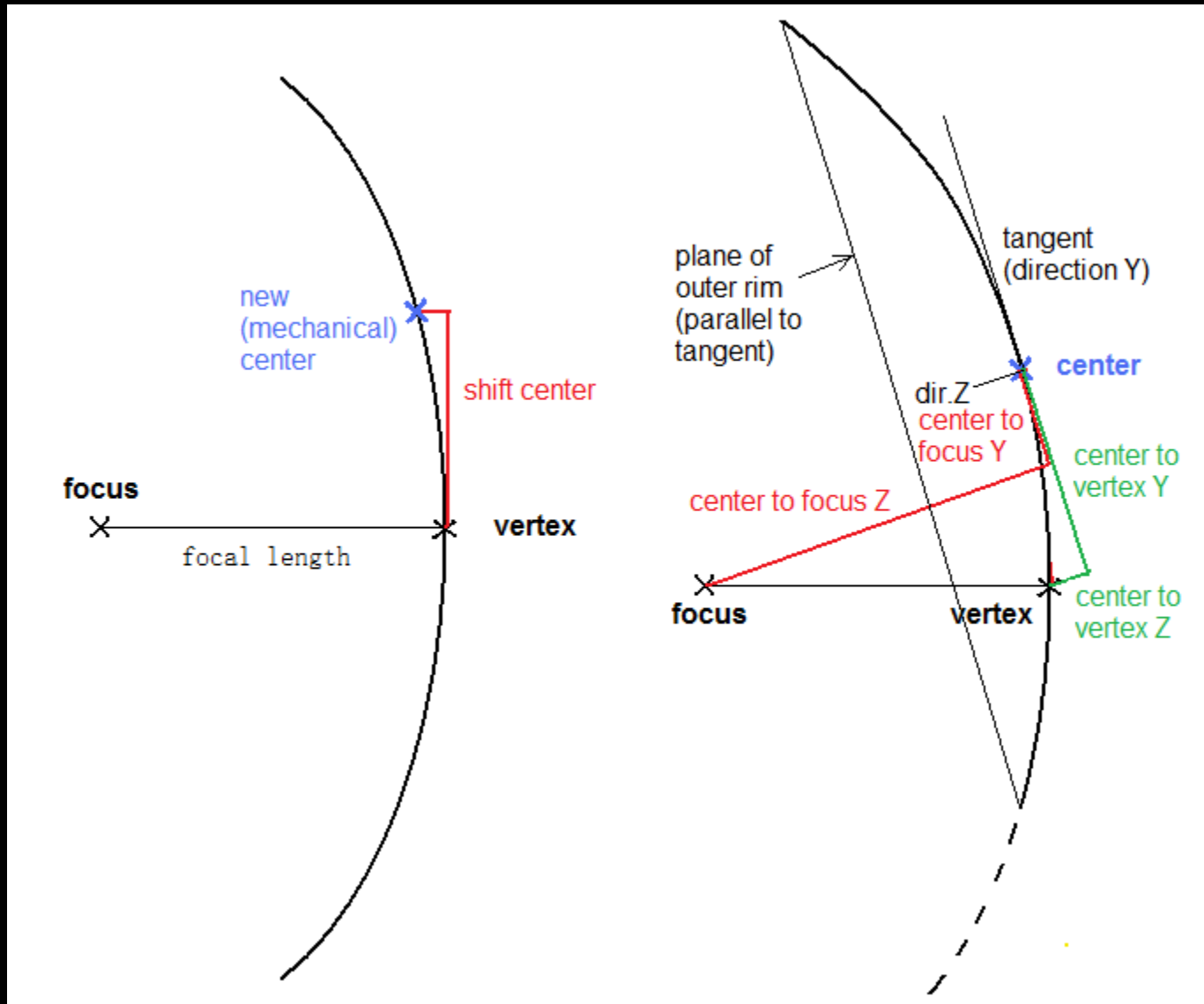
up to 10K less system temperature, depending on spillover (5%...10%) ,
around 1dB improvement on receive

- + easy access to the feed

Extra + for me: challenge ,because nobody has tried it before (?)

- constructions more difficult → subject of this lecture
- 5% to 10% more reflector surface (.... not that much)

From prime focus dish to offset dish



OE5JFL homebuilt 7,3m offset dish

Only pairs of ribs are identical
program: **Ofs_calc_jfl**

Inputs:

- Number of ribs
- Focal length
- Maximum depth of reflector,
- Shift of mechanical center up from vertex,
(depth for middle ring, radius steps)

Outputs:

Dimension chart for ribs

- Dish diameter (and long axis)
- f/D (and angle)
- Feed tilt and reflector tilt (for 0 deg elevation)
- Distance focus to (low end of) rim
- Focus and vertex position
(relative to mechanical center)

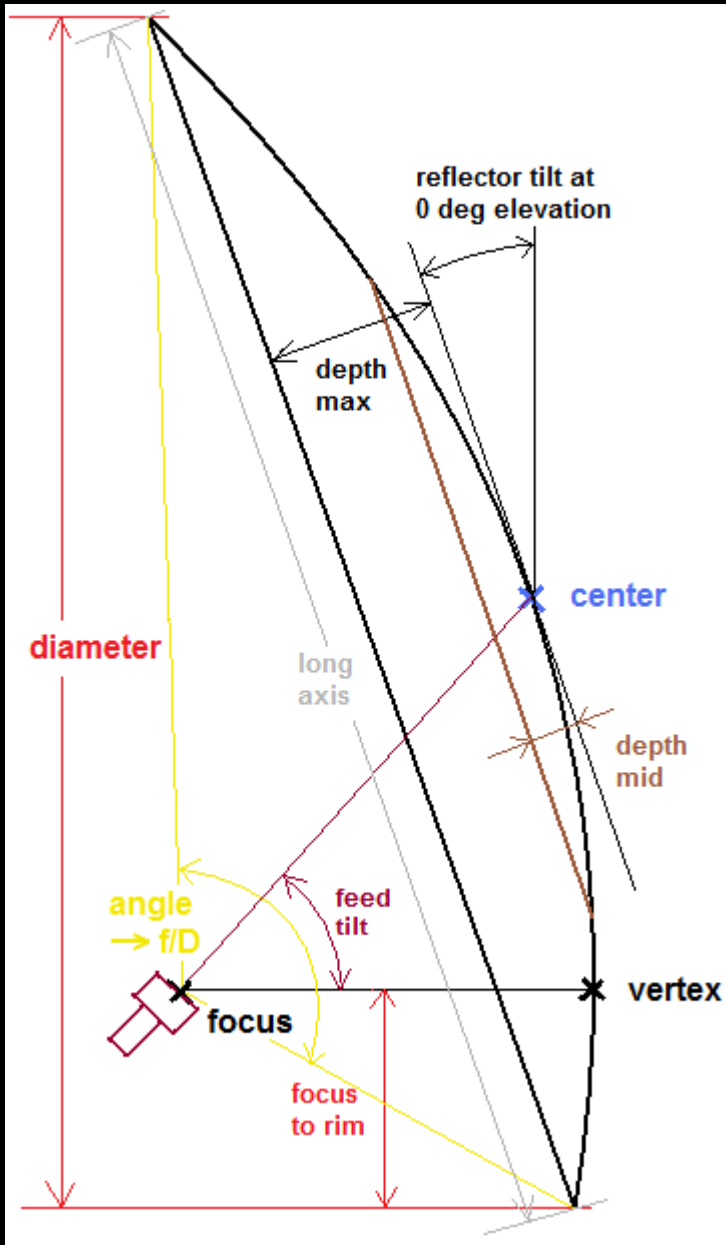


Chart with rib dimensions

[illegible]

OE5JFL homebuilt 7,3m offset dish

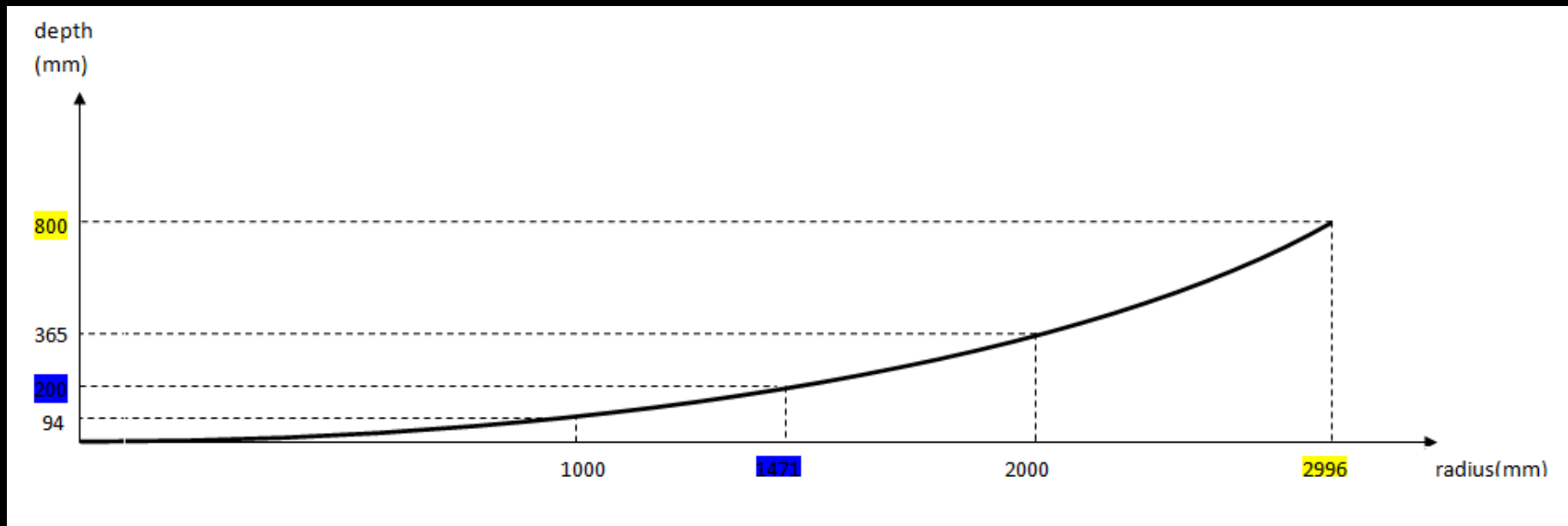
Example for using the chart

2.4m focal length, 800mm max. depth, 1.6m center shift

Result: 5.69m dish diameter with $f/D=0.46$,
the focal point is 1.25m up from the rim of the dish

Some dimensions for the rib at 60deg (same at 300deg):

Length of the rib: 2996mm, depth at 1m radius: 94mm,
depth at 2m: 365mm, radius for 200mm depth: 1471mm



OE5JFL homebuilt 7,3m offset dish



Here you can see an example for the different length and shape of the ribs for my 7.3m dish.

The template must be modified after building a pair of ribs every time.

Those extra hours of work were only a small fraction of the time I spent for realizing the whole project.

OE5JFL homebuilt 7,3m offset dish

Some photos of the building process....



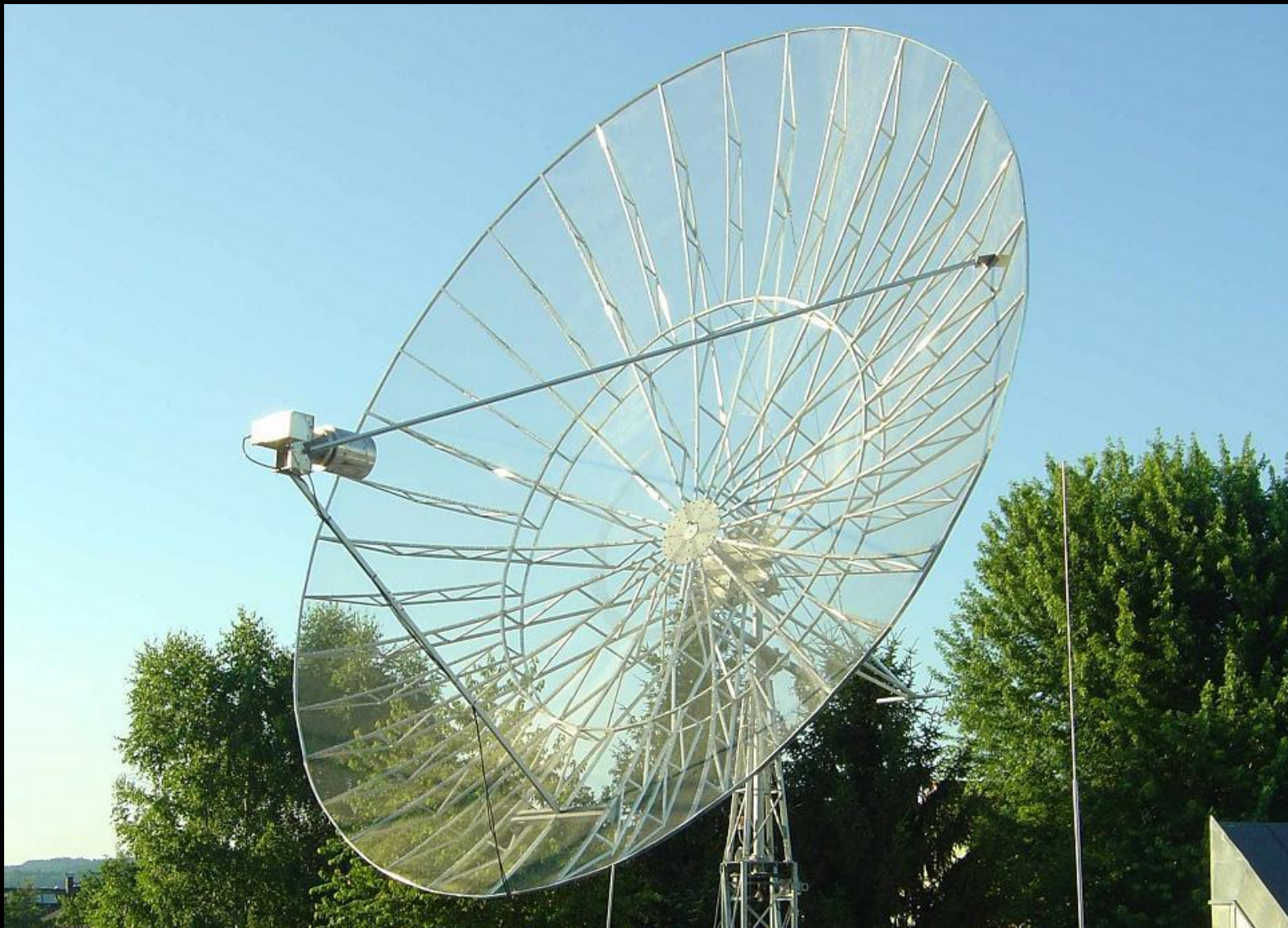
OE5JFL homebuilt 7,3m offset dish

The mast is also a special construction



OE5JFL homebuilt 7,3m offset dish

et voilà



OE5JFL homebuilt 7,3m offset dish

Dish at 0 deg elevation and 40 deg elevation

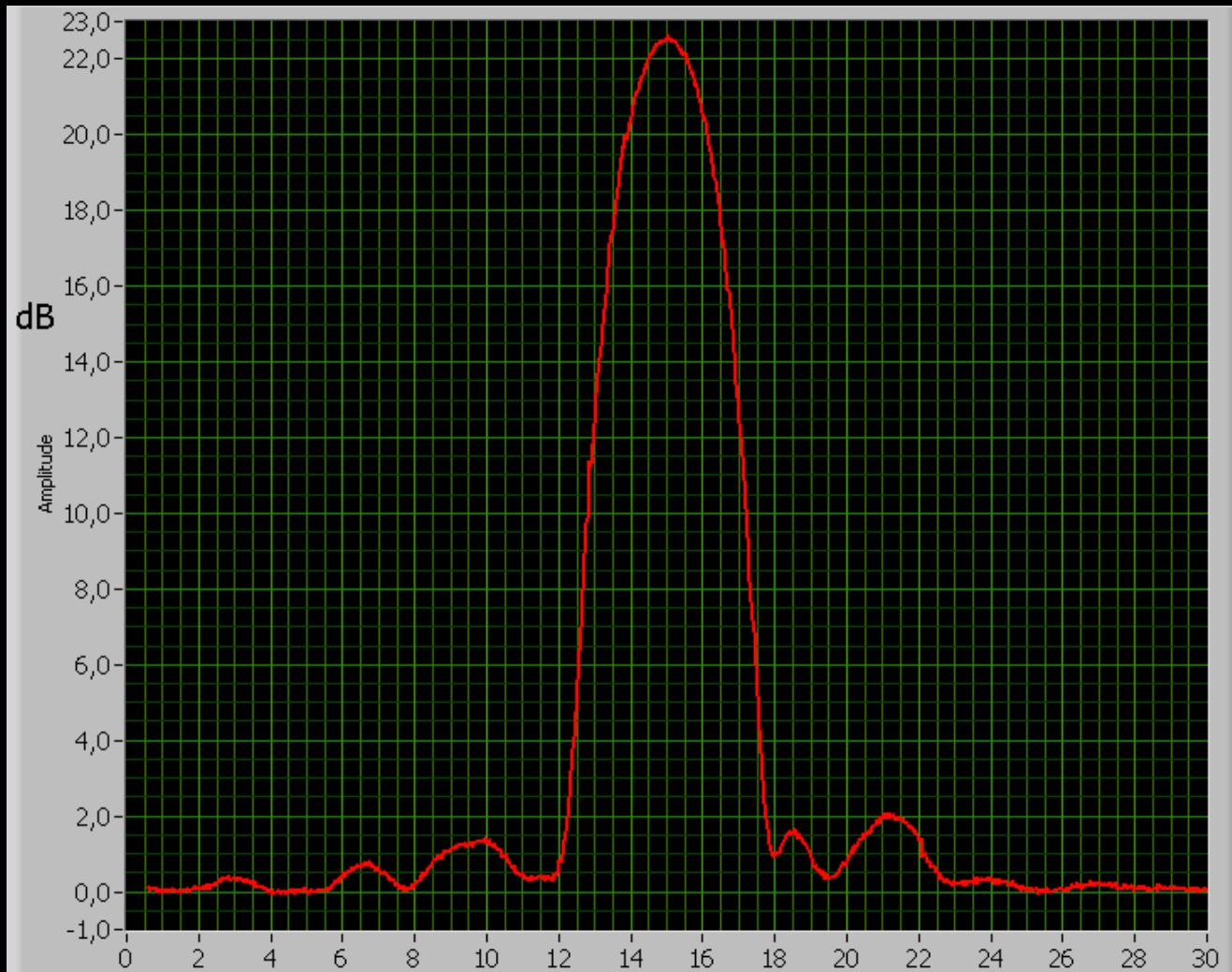


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Measurements on 23cm (with RA3AQ feed)

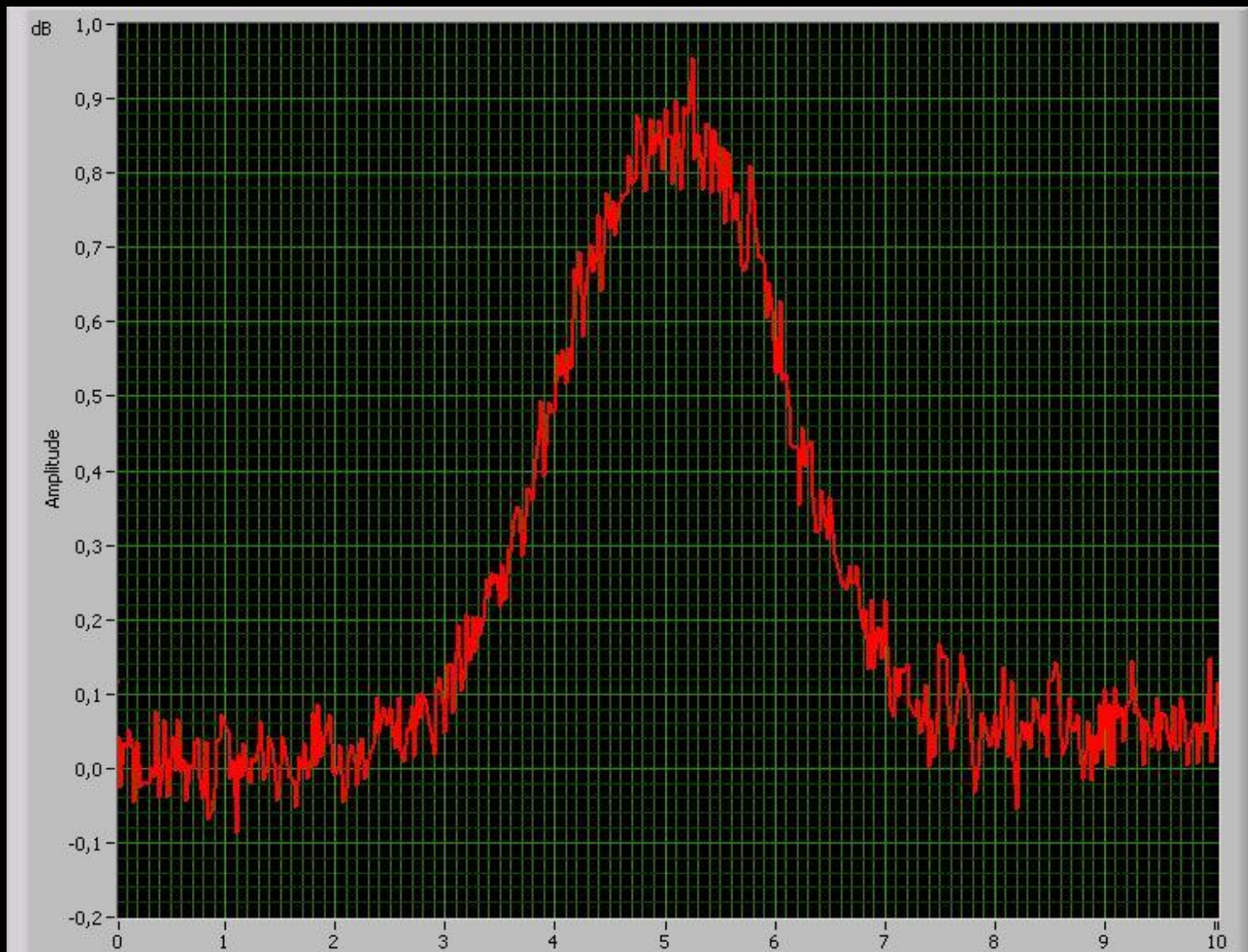
Sun noise: 22.5 dB @ SFI 107

(1 dB better than with a prime focus dish)



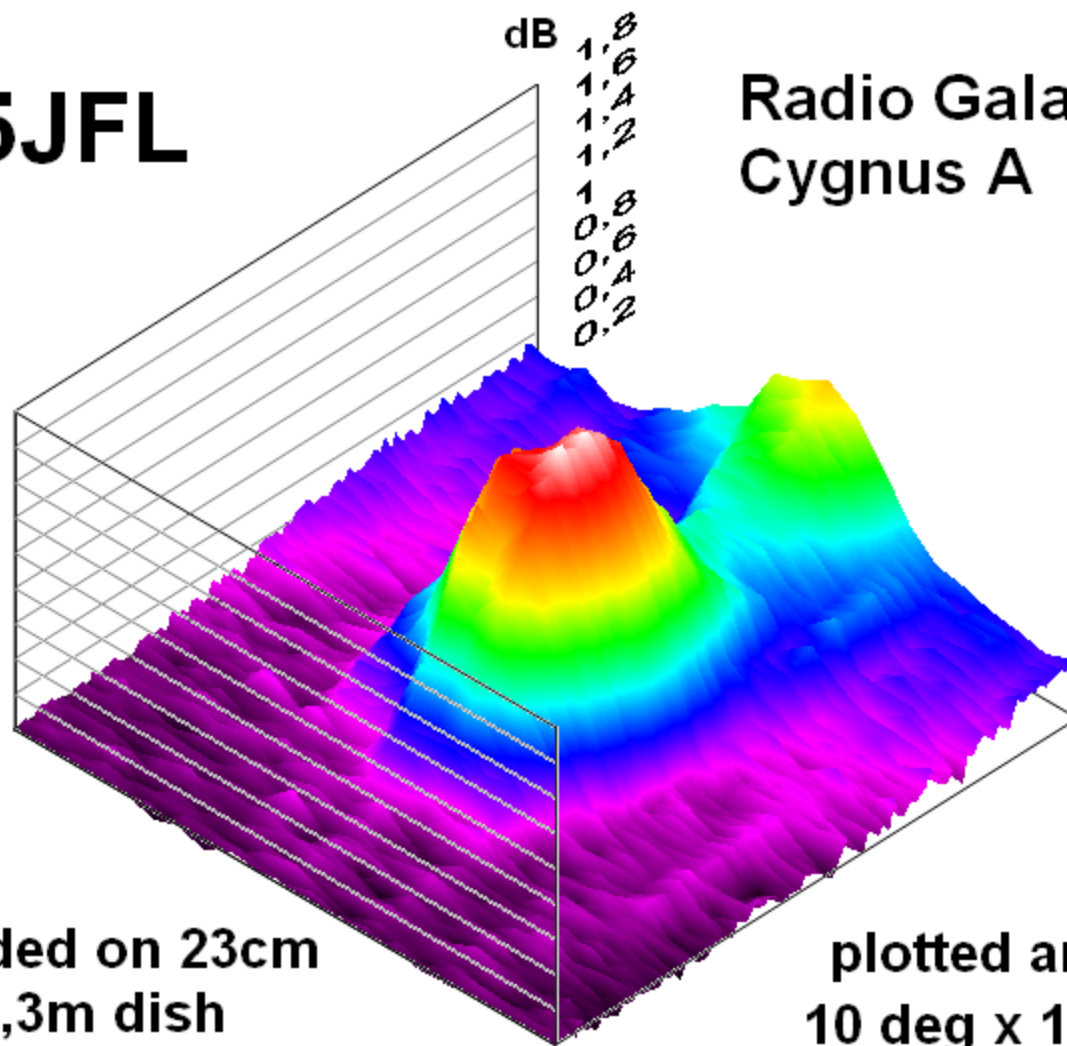
OE5JFL homebuilt 7,3m offset dish

Moon noise on 23cm



OE5JFL

**Radio Galaxy
Cygnus A**

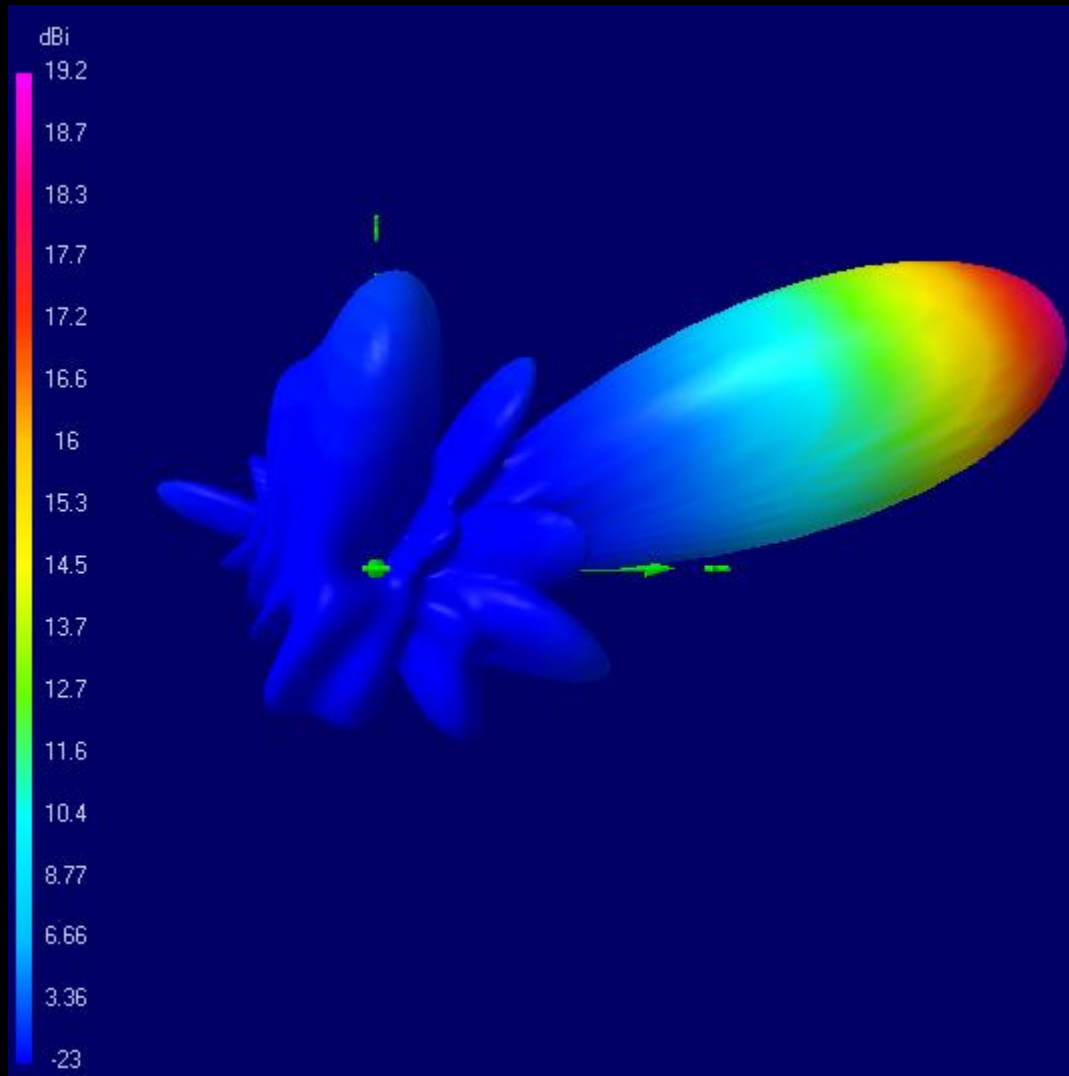


**recorded on 23cm
with 7,3m dish**

**plotted area:
10 deg x 10 deg**

OE5JFL homebuilt 7,3m offset dish

Results on 144MHz (feed: 3 el quad)



Ratio
diameter/wavelength=3.5 (!)

**Comparisons by averaging the
difference between MAP65
outputs and the reports from
LiveCQ**

Difference to my 13 element yagi
(NEC 16dBi): +3.5dB

Difference to my old 11m dish
(prime focus) : - 2.5dB

About the same receiving results
as stations with 4x8 elements or
4x9 elements

CONCLUSION

If you want to build a dish larger than 3m diameter, it is worth to choose an offset dish.

The additional work because of the more complicated construction is less than 5%

Although the improvement of G/T is only around 1dB, the big advantage is the easy access to the feed!