

Sodielec prime focus dish modifications

SODIELEC

The last but not the least – to be continued and improved

F5DQK July 2009

Sodielec prime focus

Target

- How to move its S11 initially at 8.3 GHz (from factory) up to 10.4 GHz

Abstract

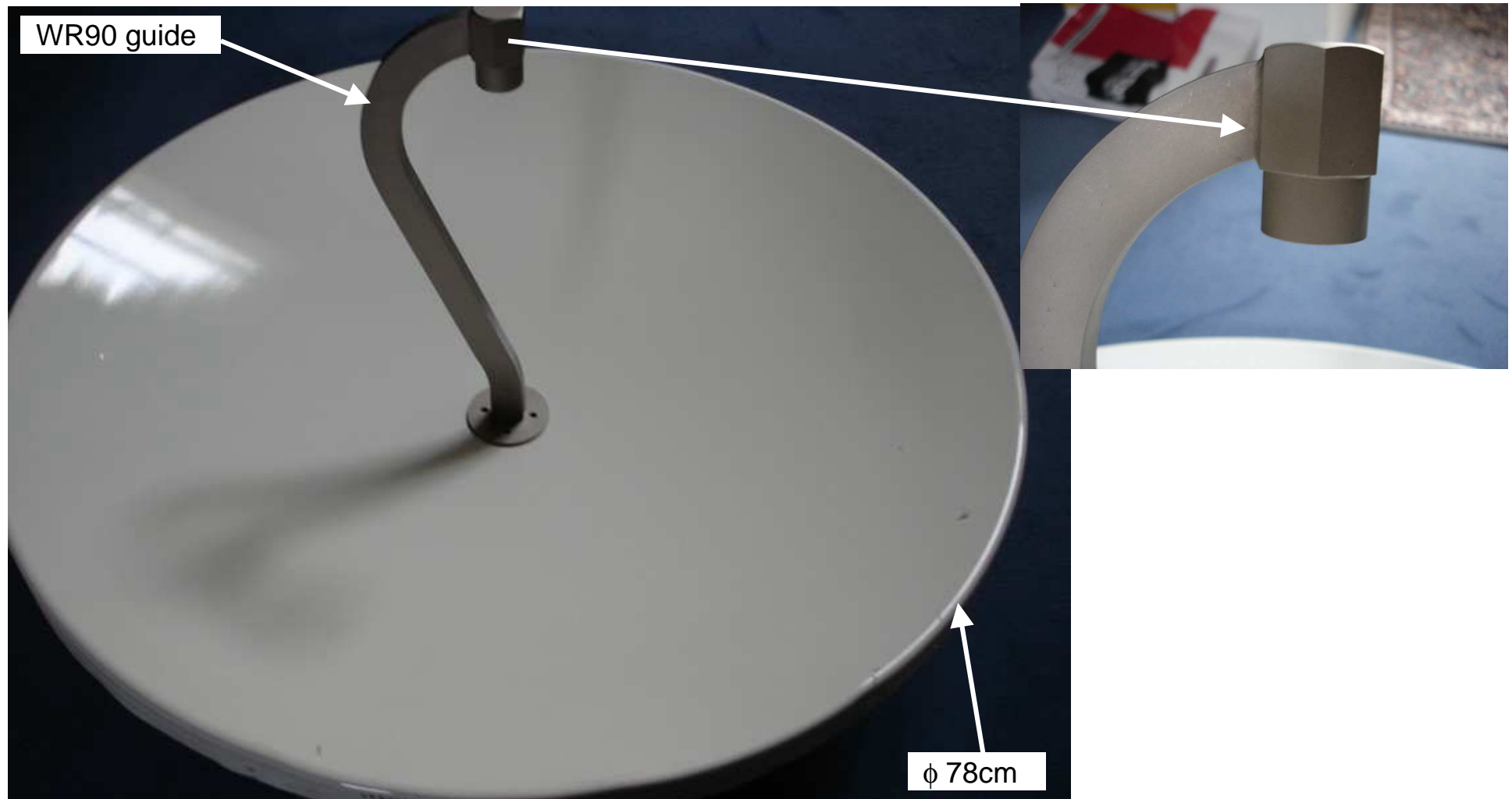
- Initial behaviour à 8.3 GHz
- 1st « side measures »
- Practical modifications done by F1CNE
 - WR90 to coax transition
 - Shepherd crook
- Conclusion

Initial behaviour

Initial behaviour

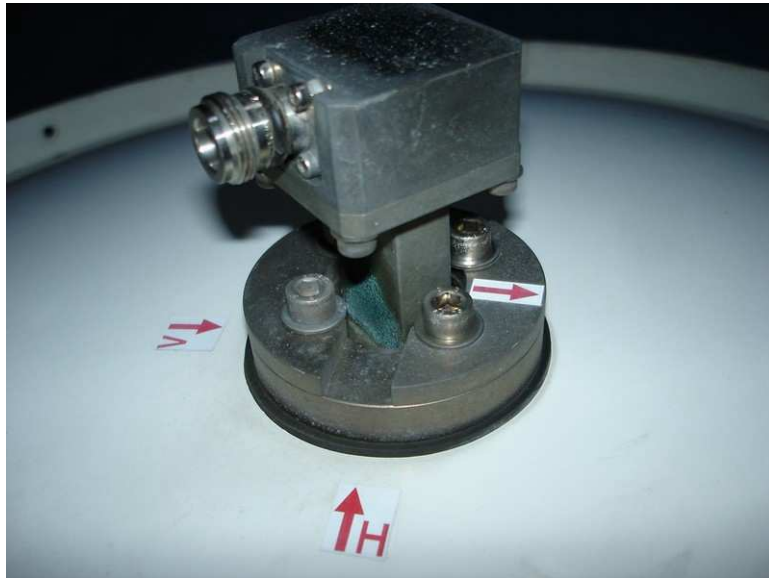
Initial behaviour

Front view : shepherd crook feed



Initial behaviour

Rear view : initial WR 90 / N adapter optimised at 8.3 GHz

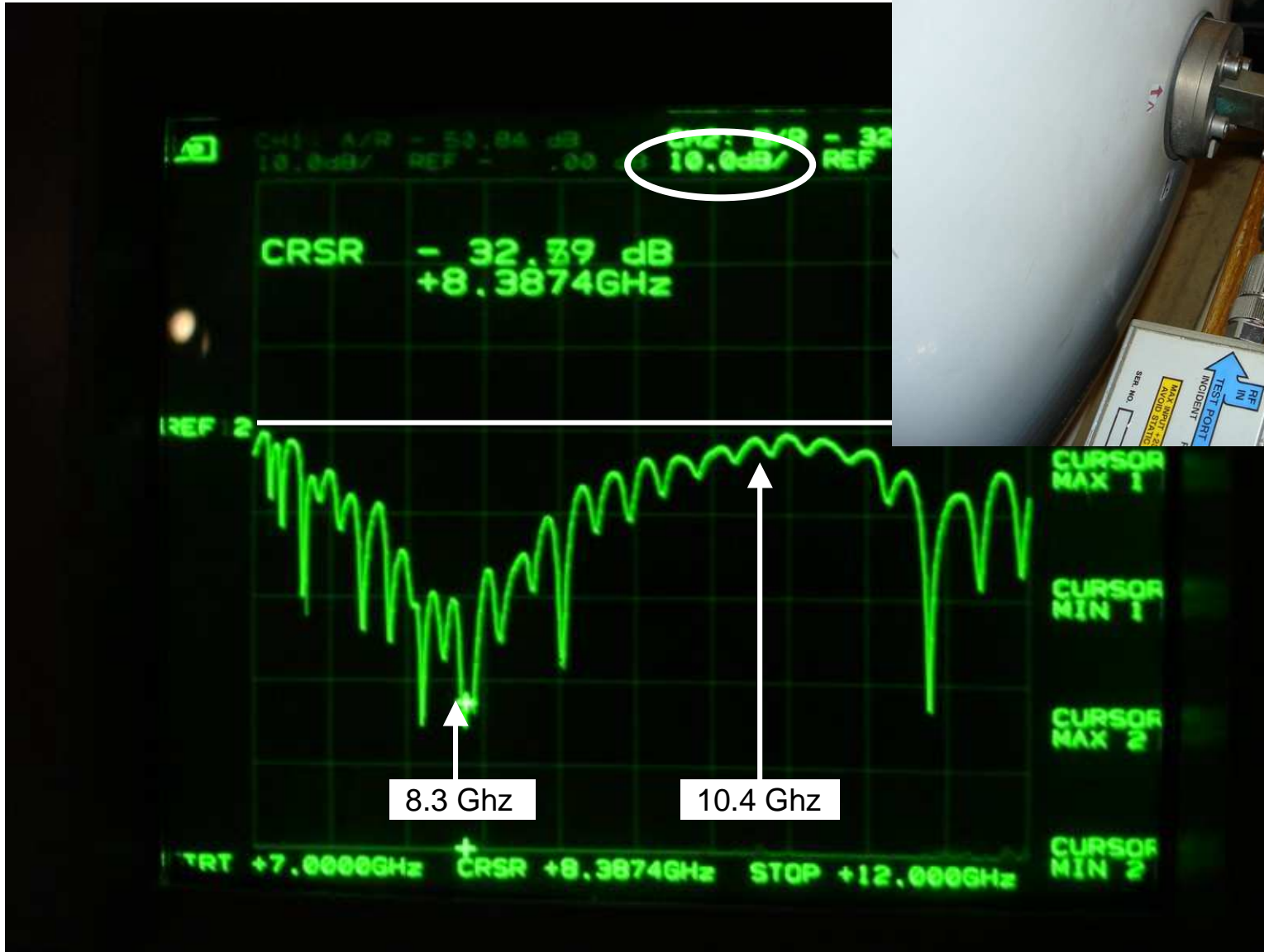


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Sodielec prime focus

Initial behaviour

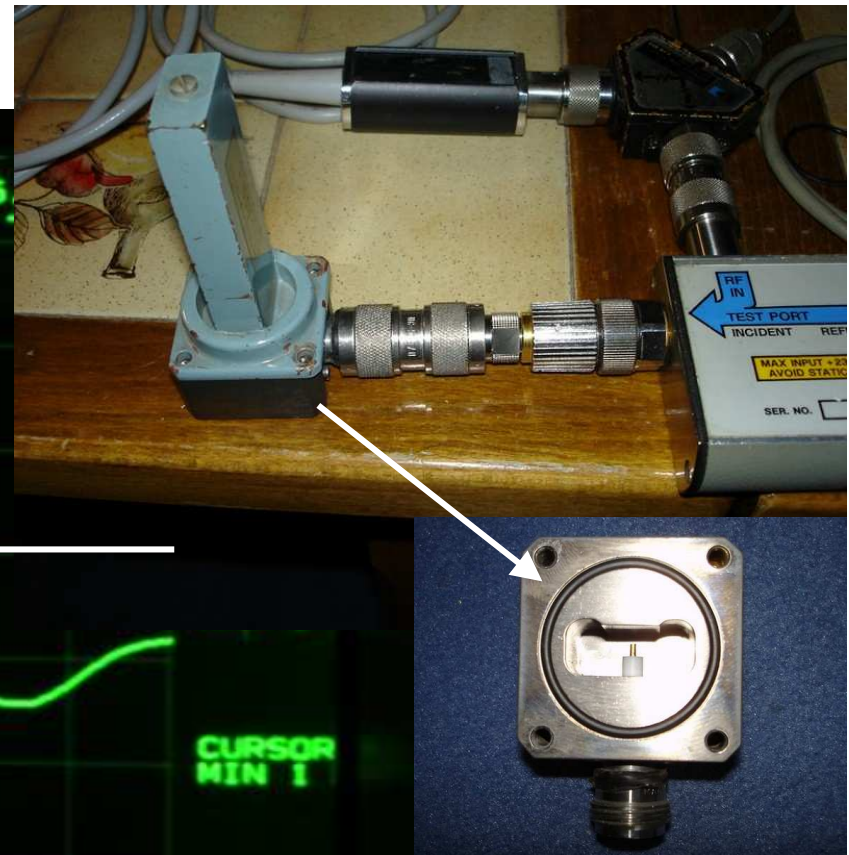
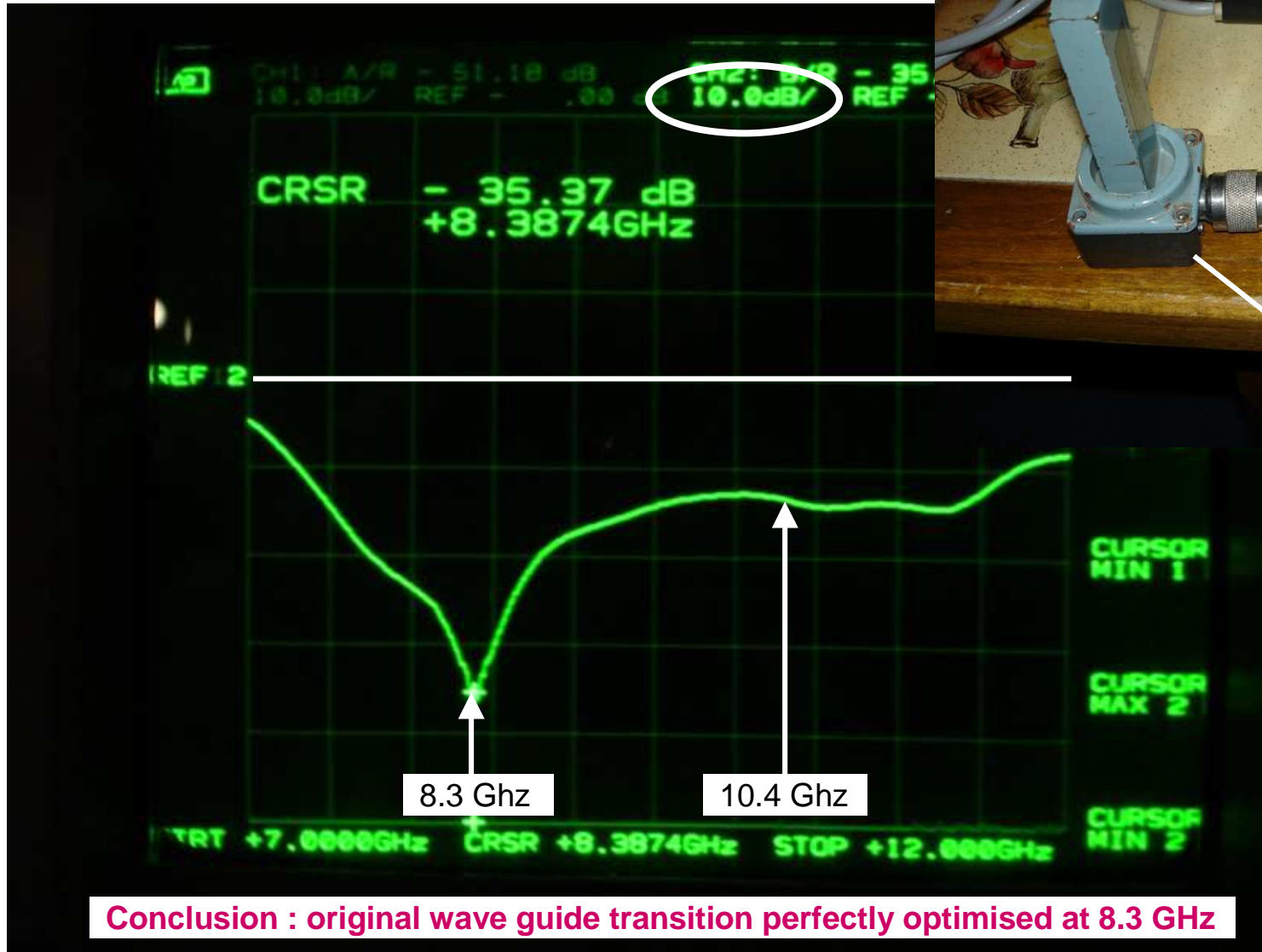
Whole initial S11 measured with HP 8757a



1st « side measures »

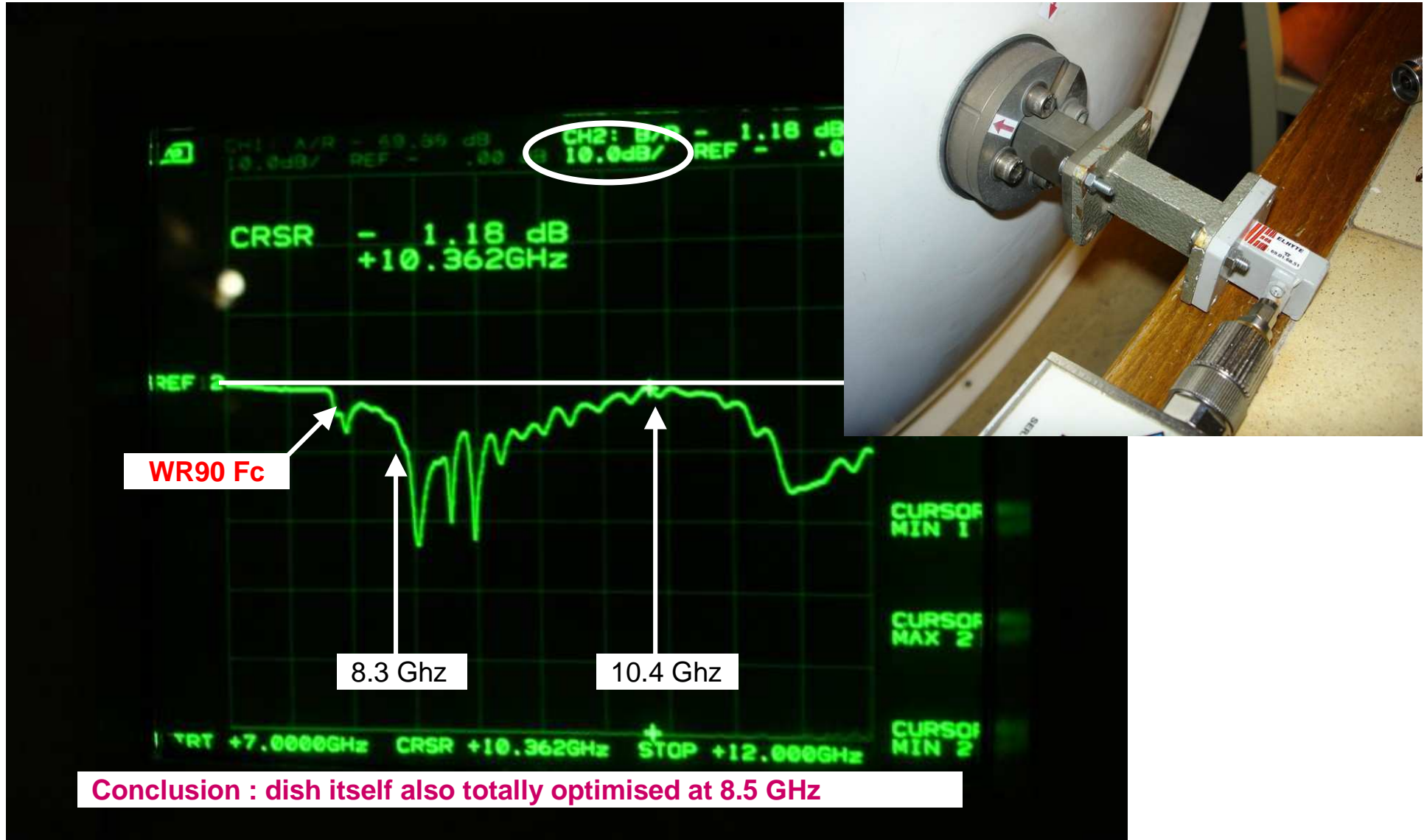
First « side » measures

S11 of initial WR 90/N transition alone



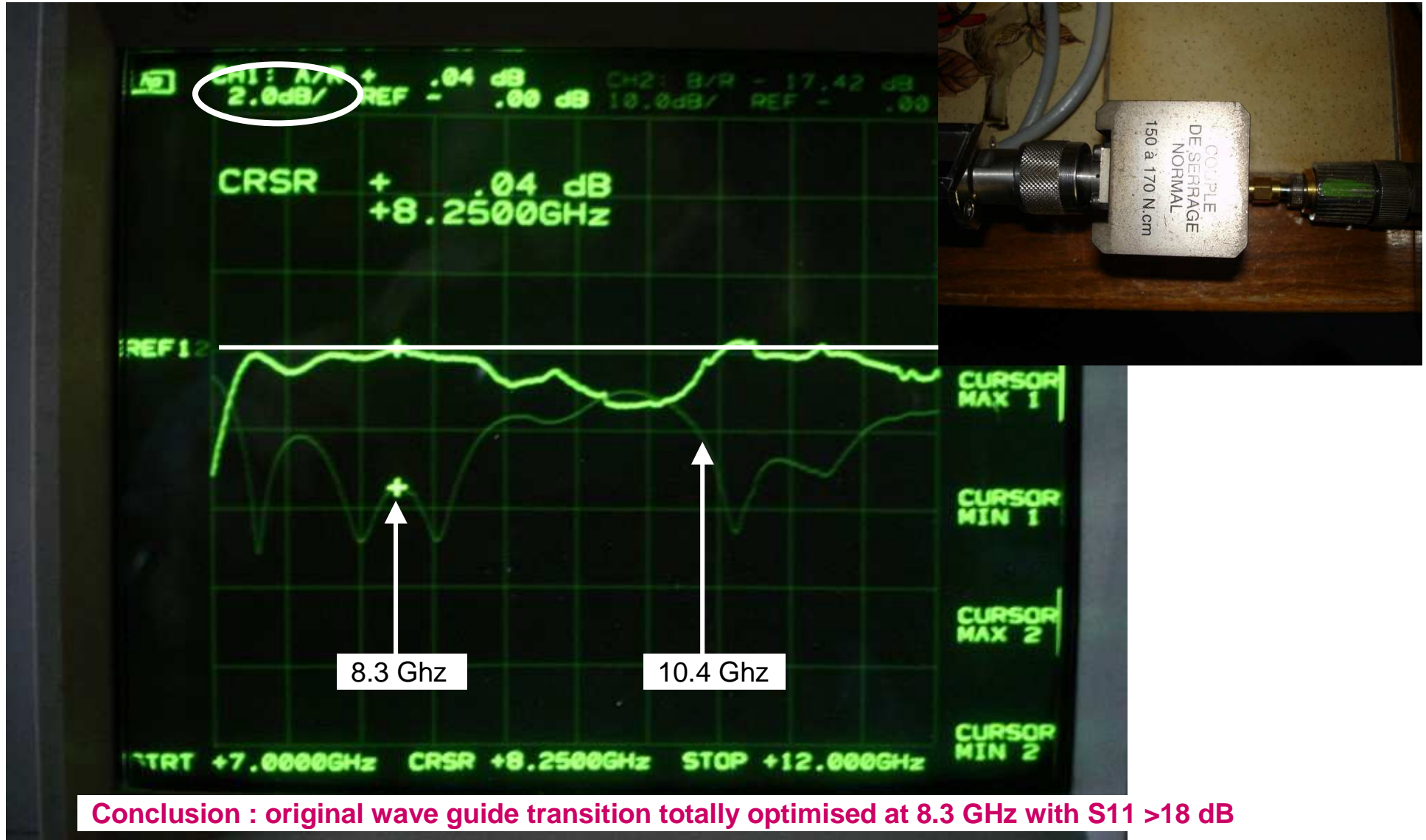
Initial behaviour

Substitution with a real broadband WR90/WR then WR75/SMA transition : S11 meas



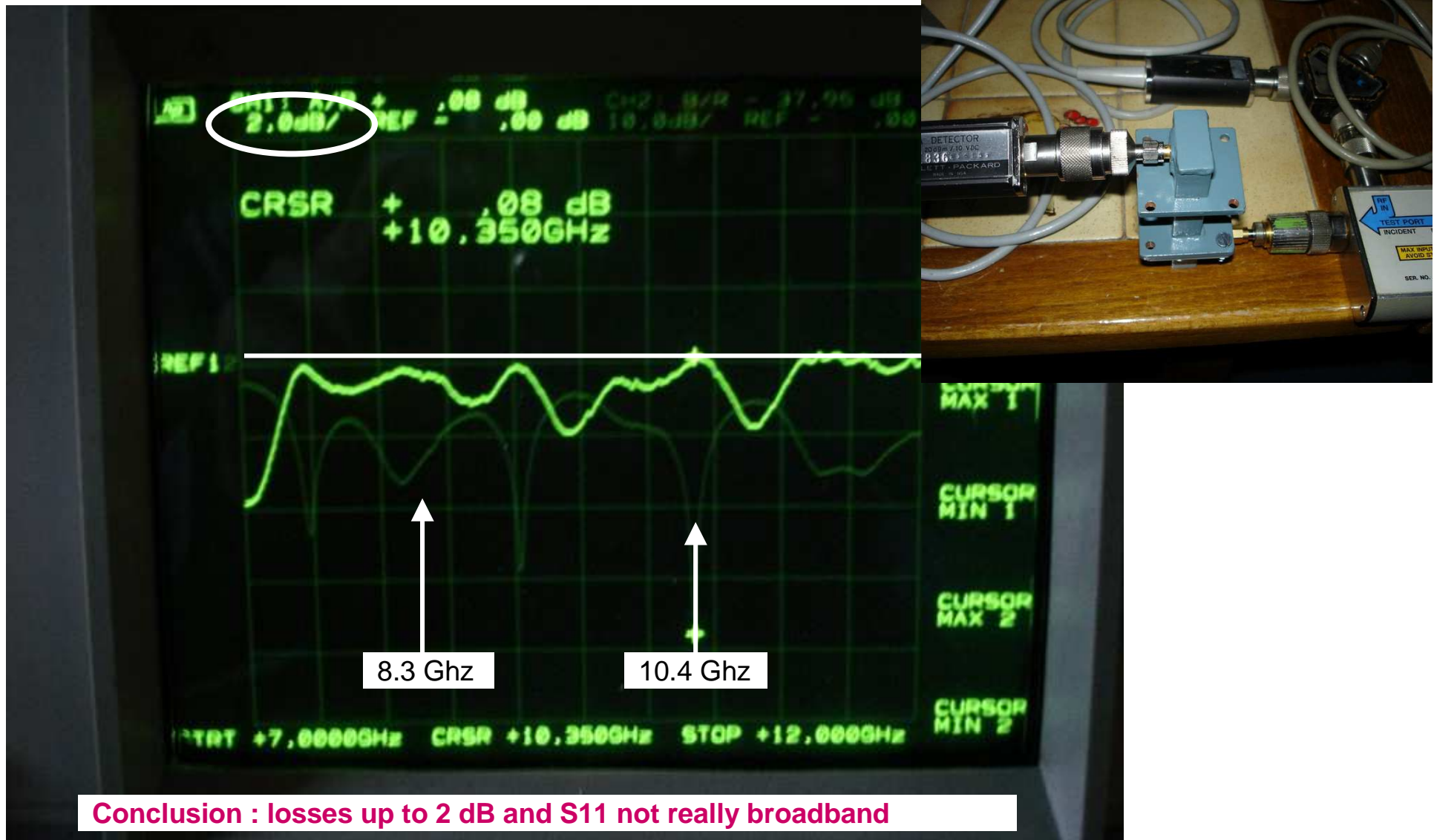
Initial behaviour

S21 + S11 of original WR90/N + other real broadband WR75/SMA serial transitions



Initial behaviour

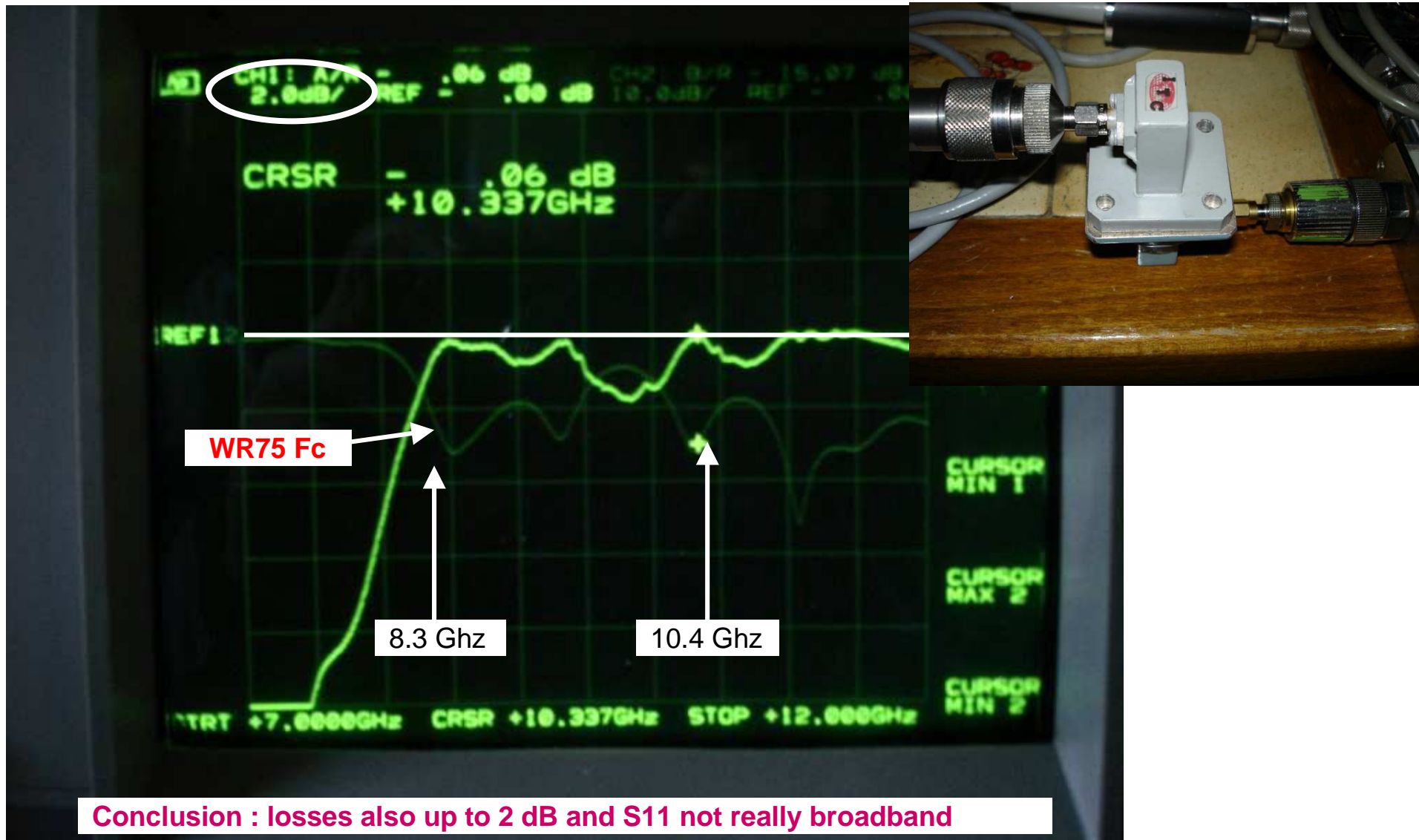
S21 + S11 meas of 2 not optimised broadband WR 90/SMA serial transitions



Conclusion : losses up to 2 dB and S11 not really broadband

Initial behaviour

S21 + S11 meas of 2 good broadband WR 75 / SMA serial transitions



Initial behaviour

S11 meas of 1 WR 90 / SMA + serial screw transitions



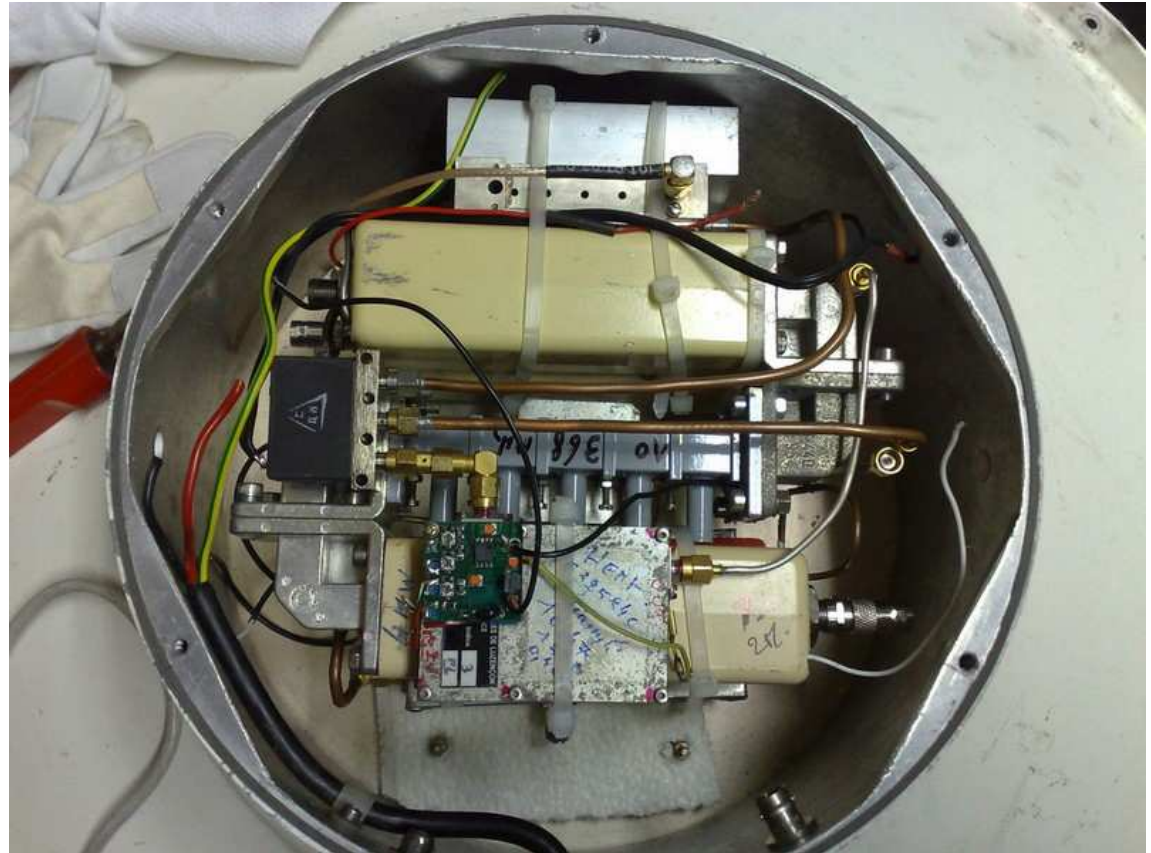
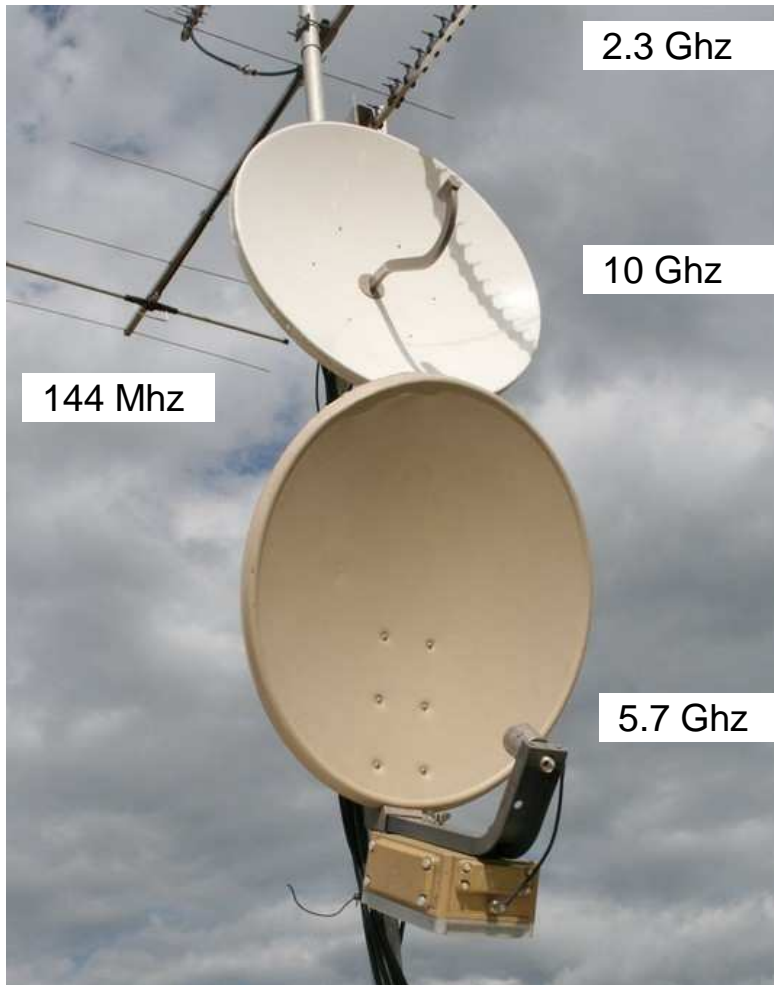
Practical mods done by F1CNE

- **WR90 to coax transition mods**
- **Shepherd crook feed mods : 2 different ways possible**

Solution of F1CNE

F1CNE whole /p ensemble

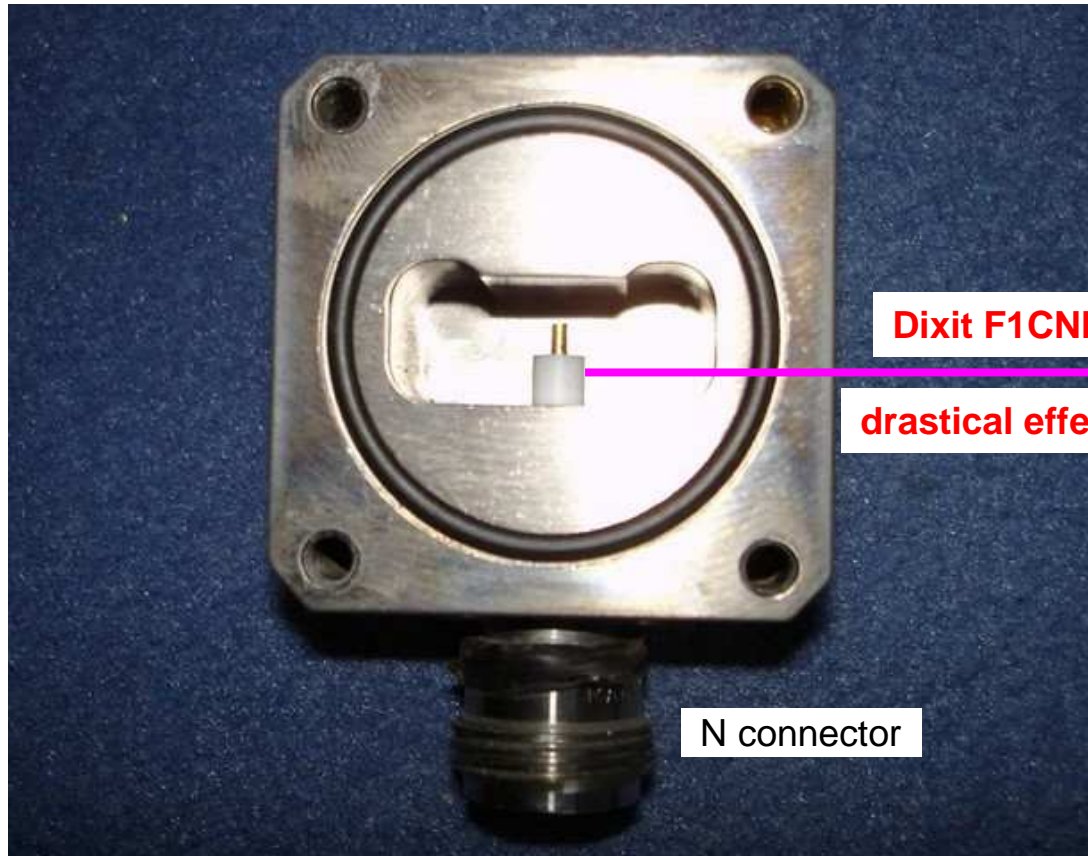
Rear dish view



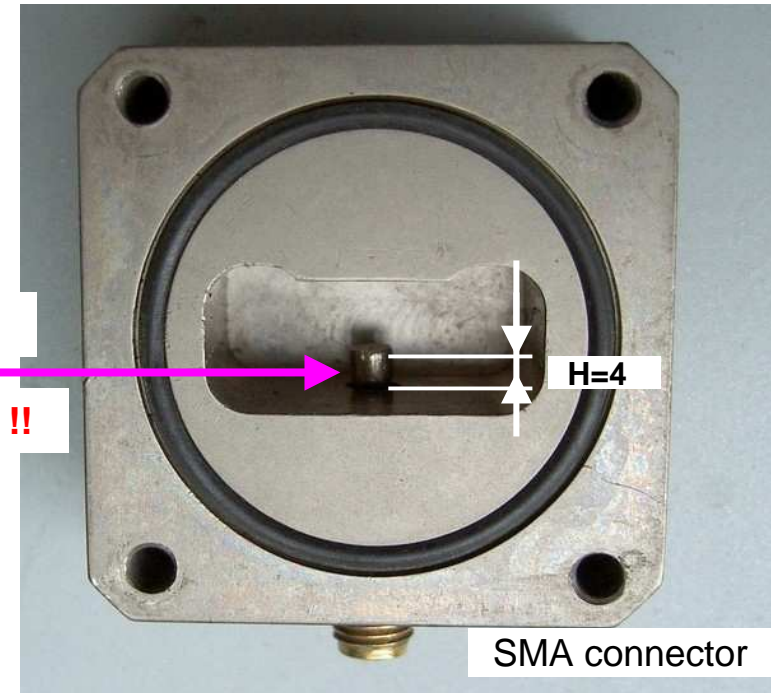
Solution of F1CNE

WR90 transition : $\lambda/4$ antenna filed in order to obtain the best S11 compromise

Original

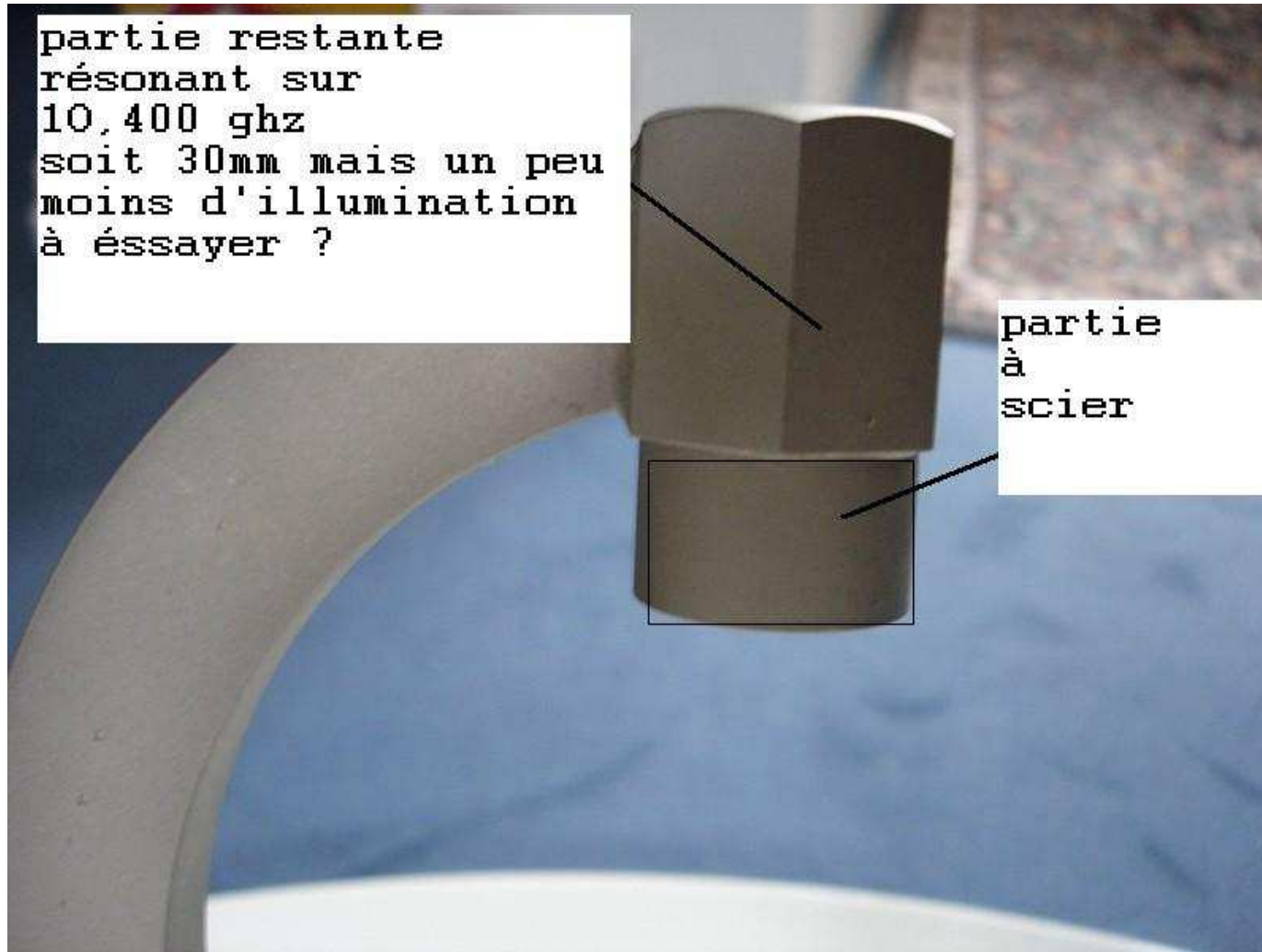


After filing



Solution of F1CNE

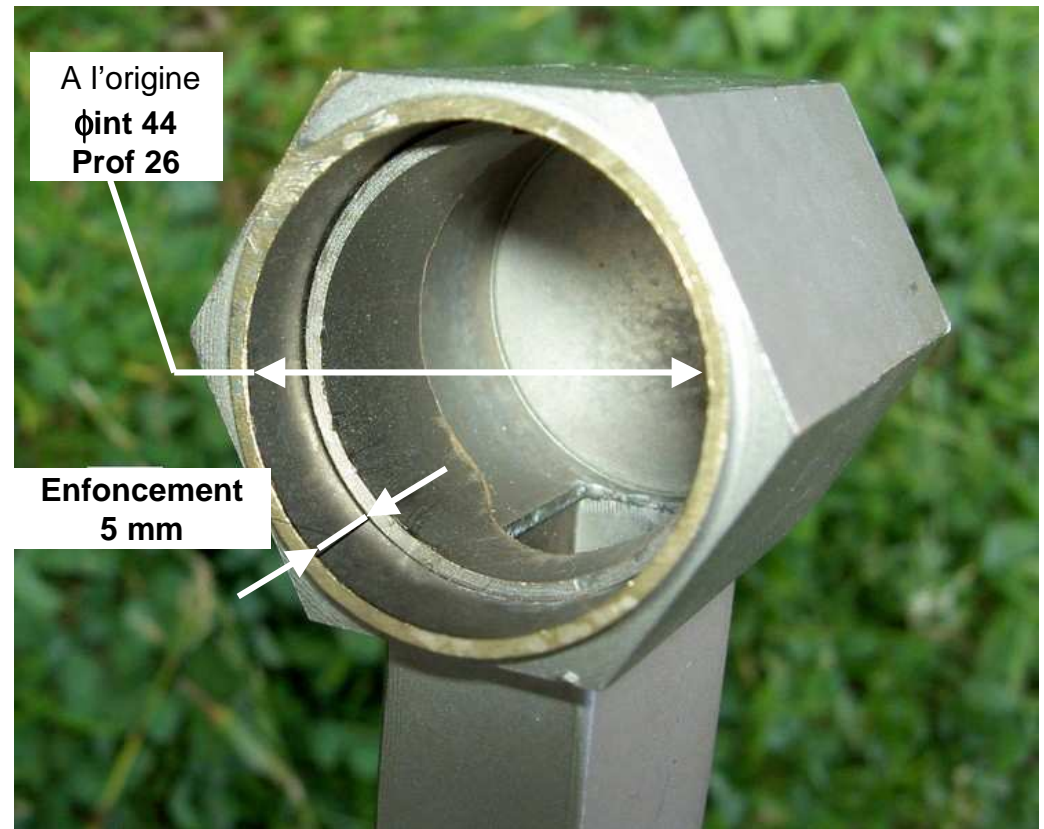
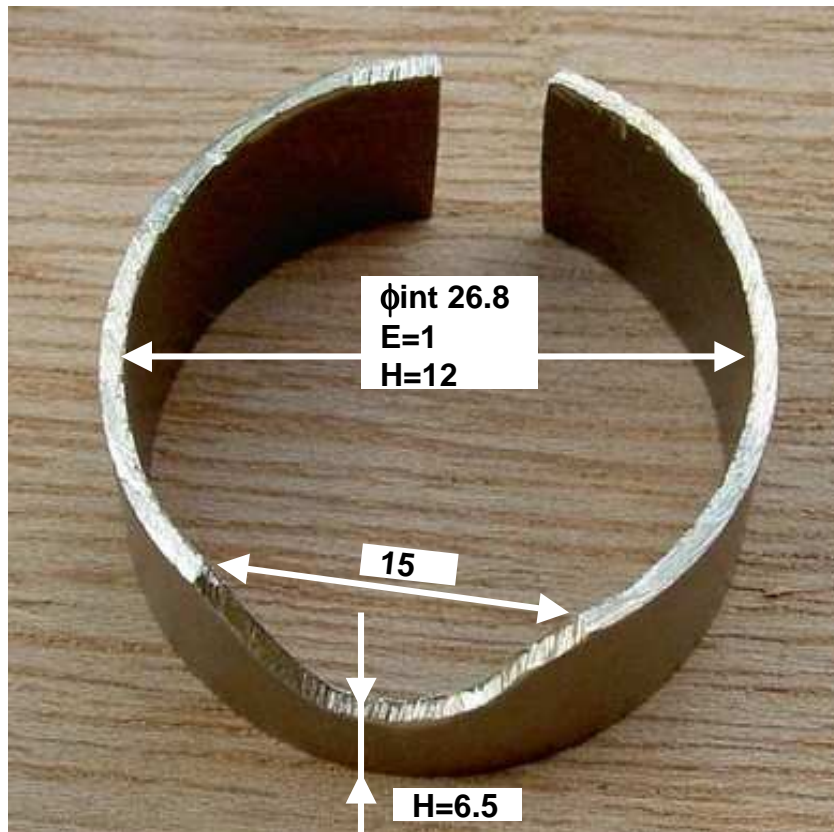
Shepherd crook transformation : 1st way



Solution of F1CNE

Shepherd crook transformation : 1st way

Adaptation ring after sawing : must « self stay » in place as a spring \longrightarrow giving 2 to 3 dB more

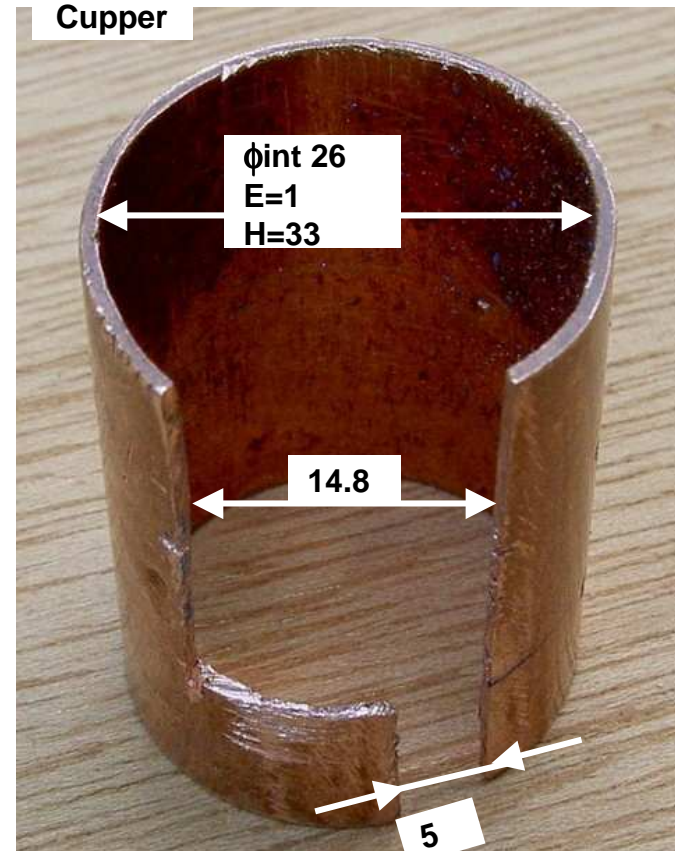
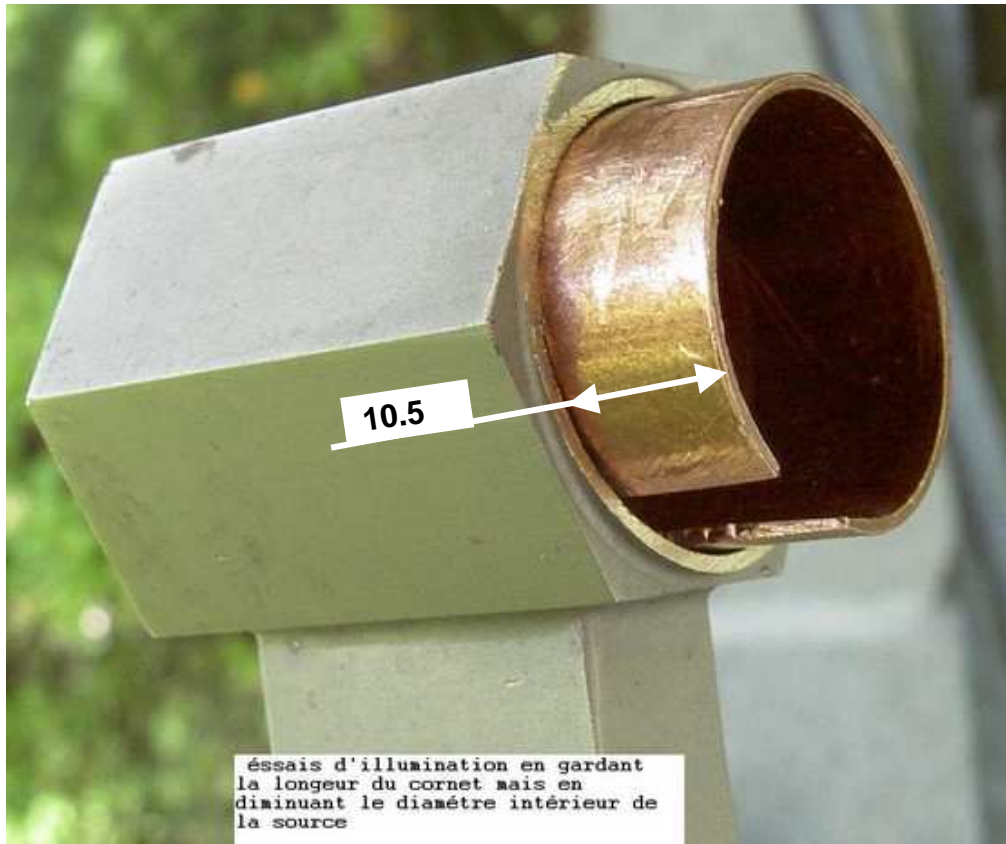


Dimensions in mm before in place

Solution of F1CNE

Shepherd crook transformation : 2nd way

Or how to keep the illuminating internal point at the same place → giving 2 to 3 dB more



Solution of F1CNE

Final S11 prime focus dish measures

- to be done in a nearest future

Conclusion

Conclusion

- Dish ensemble initially factory optimised à 8.3 GHz : feed AND WR90/coax transition
- The S11 move of the waveguide/coax adaptation alone up to 10.4 GHz seems not easy to be done and is far than enough !!
- The shepherd-crook feed adapting target à 10.3 GHz is **THE** real good solution