

# SOLEIL BOOSTER RF SYSTEM

A silhouette of a sprinter in a starting crouch on a track, positioned to the left of the speaker list box.

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Robert Lopes  
Fernand Ribeiro  
Ti Ruan

6<sup>th</sup> ESLS RF Meeting

Villigen, November 28 - 29, 2002

# SOLEIL BOOSTER RF SYSTEM

Jean Polian

## CAVITY :

- LEP 5 cells cavity @ 352.2 MHz

## TRANSMITTER :

- 40 kW solid state (MOSFET) amplifier (T. Ruan, R. Lopes and F. Ribeiro contributions in this meeting)



## SOLEIL BOOSTER RF SYSTEM

When we started a study of the Booster Amplifier, the RF power requested was 30 kW CW and we designed a 40 kW amplifier. Well, one year ago the design of the Booster ring was changed, and the power needed had been decreased, but we decided to keep the same power to facilitate future developments (200 kW for main ring amplifier?).



## SOLEIL BOOSTER RF SYSTEM SCHEDULE

We are making a 40 kW MOSFET amplifier in the LURE RF building.

*February 2003:* All power supplies ready.

*April 2003:* All power dividers and combiners ready.

*August 2003:* 150 X 330 W modules are tested in LURE.

*September 2003:* LEP 5 cells cavity is delivered in LURE.

*December 2003:* Test of 40 kW amplifier on 50  $\Omega$ .

*January 2004:* Test of the cavity with the 40 kW amplifier.

*June 2004:* Installation of 40 kW amplifier and cavity on the Booster ring.

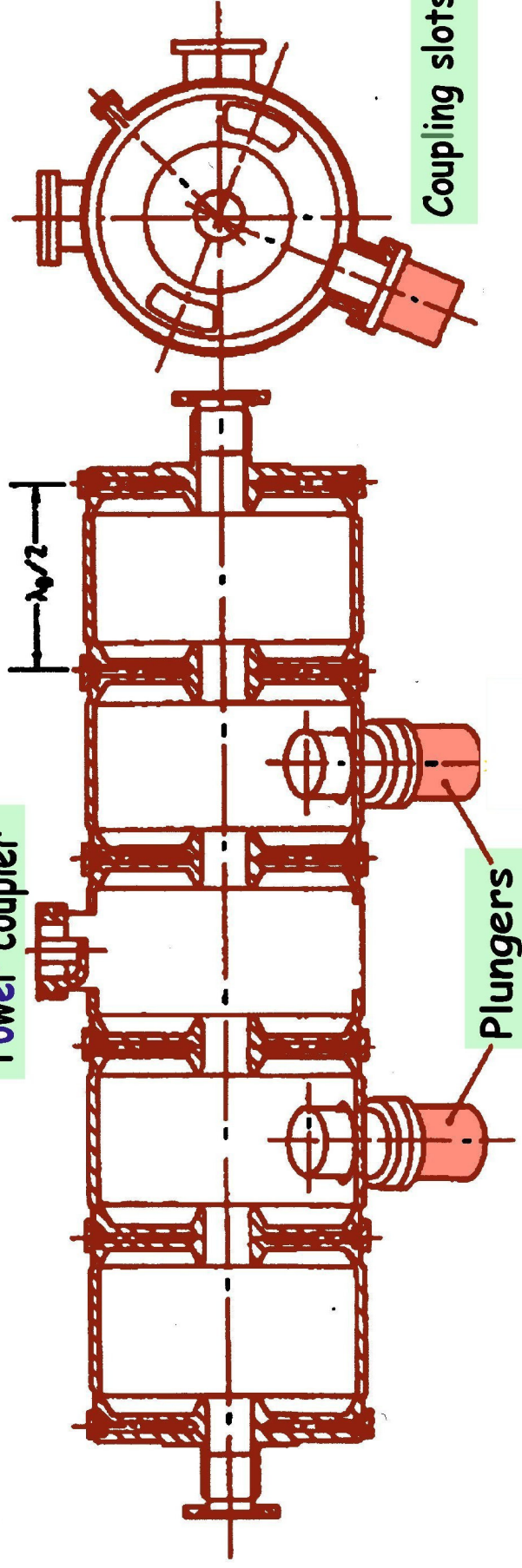
# 5 CELLS LEP CAVITY



# 5 Cells cavity for SOLEIL Booster



Power coupler

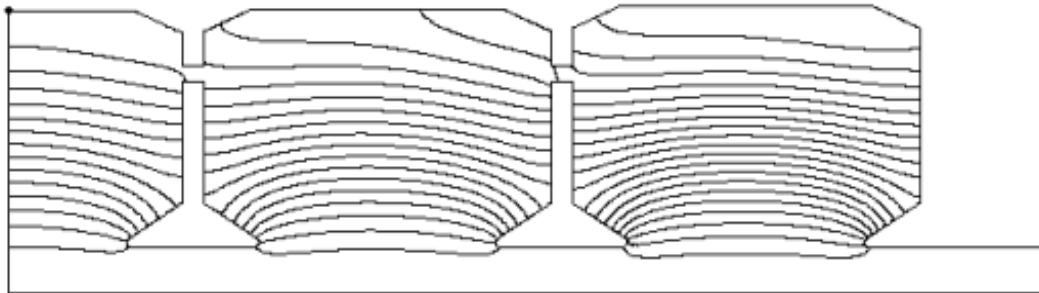


$F = 352.2 \text{ MHz}$     $Z_{\text{shunt}} = 53.6 \text{ M}\Omega$  (linac  $\Omega$ )    $Q = 38\,500$

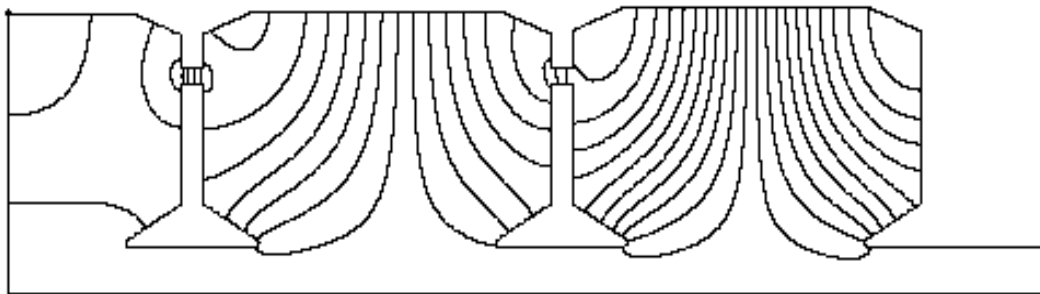
**5 CELLS LEP CAVITY FOR SOLEIL BOOSTER**

## SOLEIL BOOSTER RF SYSTEM

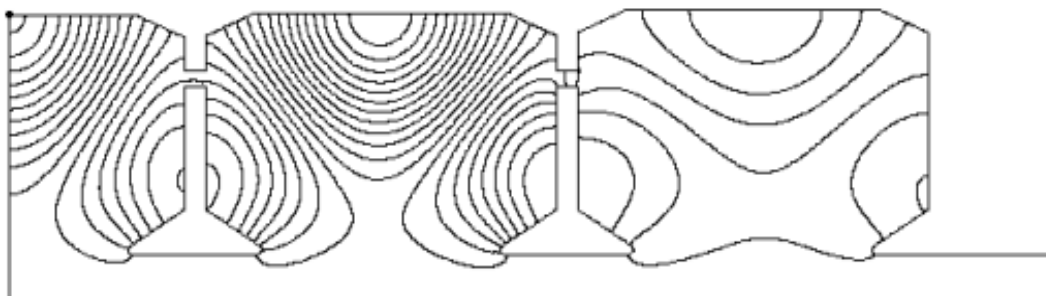
**3 modes in a  
5 cells LEP Cavity (Superfish)**



**355 MHz**



**510 MHz**



**800 MHz**



S21  
REF -69.1 dB  
2 5.0 dB  
▽ -42.496 dB  
HP

109 MAG

MARKER 2  
352.144 MHz  
point 49

MARKER 2  
352.14 MHz  
-42.496 dB

*Plongeurs entés  
de 46 mm*

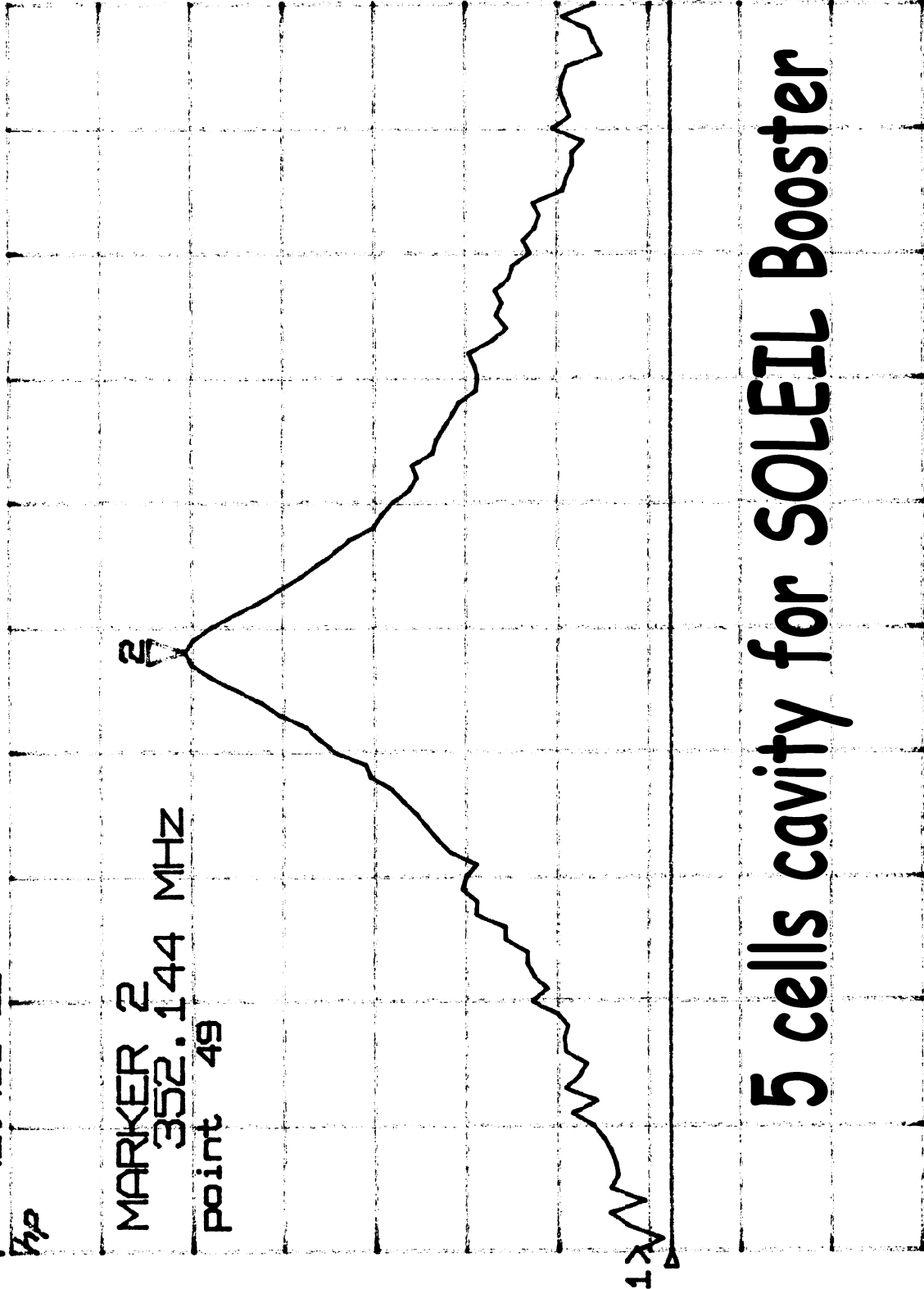


Figure 5

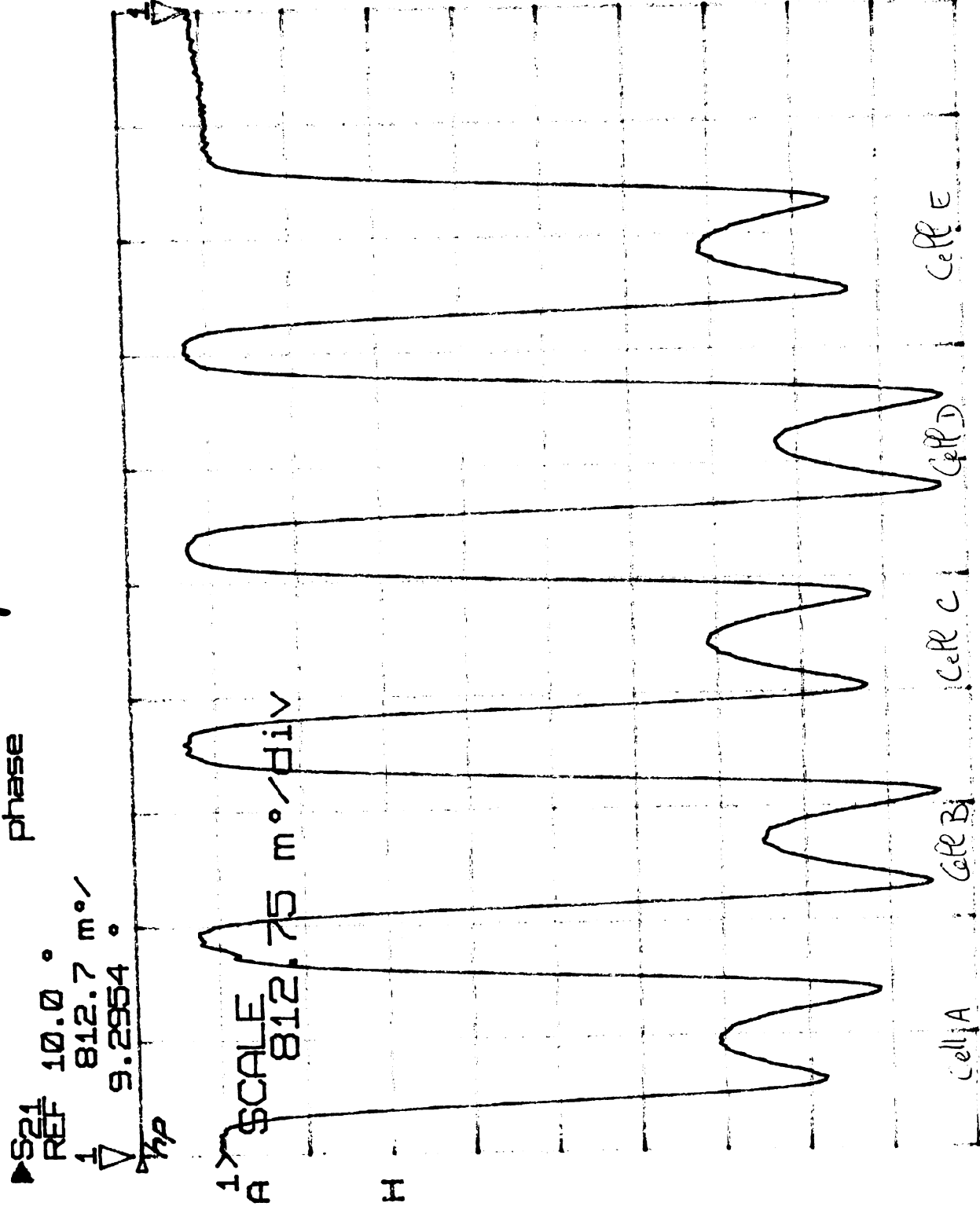
# 5 cells cavity for SOLEIL Booster

CENTER 0.352148000 GHz  
SPAN 0.000200000 GHz

05 MAR 02  
15:40:13

# 5 cells cavity for SOLEIL Booster

MARKER 1  
352.14 MHz  
9.2954 °



With power coupler  
and waveguide

F lab for F vac SOLEIL at 30°C

05 MAR 02  
17:05:18

STOP  
0.35214000 GHz

START  
0.35214000 GHz

Figure 4

# RF BOOSTER FEEDBACK LOOPS

