

Minutes RF structure meeting 09.11.2007

F. Gerigk, M. Pasini, S. Ramberger, C. Rossi, M. Vretenar, R. Wegner

news & facts:

DTL cold model

- first bead-pull measurements have been done, but the system is not yet fully operational,

DTL hot model

- discussed outside the meeting: the work on the model to be built in Saudi Arabia will probably only start next year, when there are first results from the model that is being built in Italy,

PIMS

- a series of meetings with Pierre Bourquin and Jean-Michel Lacroix will start to define the mechanical design of a hot model and then the series version.

CCDTL tests:

- the vacuum pump for the CERN prototype is under repair,
- Rolf and Matteo have measured the field levels in two cavities of the Russian prototype for different duty cycles:

1st measurement: low duty cycle (0.05%): pulse period 500 ms, pulse length: 0.25 ms

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	316	247	± 17
tank 1 [waveguide]	60.3	1	865	262	± 15
tank 2	59.7	5	914	280	± 15

2nd measurement, similar power, same duty cycle, detectors on tank1 and tank2 exchanged: pulse period: 500 ms, pulse length: 0.25 ms

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	313	243	± 17
tank 1 [waveguide]	60.3	5	858	290	± 15
tank 2	59.7	1	906	250	± 15

3rd measurement, power increased, same duty cycle (0.05%): pulse period: 500 ms, pulse length: 0.25 ms

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	417	361	± 17
tank 1 [waveguide]	60.3	1	1096	390	± 15
tank 2	59.7	5	1166	420	± 15

4th measurement, same power, same duty cycle, detectors on tank1 and tank2 exchanged: pulse period: 500 ms, pulse length: 0.25 ms

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	417	361	± 17
tank 1 [waveguide]	60.3	1	1096	434	± 15
tank 2	59.7	5	1168	380	± 15

Results: The power-voltage conversion of detector 5 has changed since its calibration (all detectors was disassembled and assembled to remove metallic pieces that were inside these detectors). The good result is, that the power indicated by both detectors is similar in both CCDTL tanks (<5% difference) independent on the power level.

For further measurements, other detectors were used that were not disassembled.

5th measurement, high power, high duty cycle (5%): pulse period 20 ms, pulse length 1.0 ms, frequency 352.0741 MHz

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	380	317	± 17
tank 1 [waveguide]	60.3	R2	810	342	± 15
tank 2	59.7	R1	874	339	± 15

6th measurement, high power, high duty cycle (5%), detectors swapped: pulse period 20 ms, pulse length 1.0 ms, frequency 352.0667 MHz

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	380	317	± 17
tank 1 [waveguide]	60.3	R1	785	323	± 15
tank 2	59.7	R2	882	345	± 15

Results: for all power levels and duty cycles the power measured in tank1 is nearly the same as in tank2 (<6% difference). This is confirmed by the temperature increase of the cooling water in the drift tubes in both tanks (dT=10K). Furthermore there was less than 100W peak power in the coupling cell for all measurements.

A last measurement was taken to increase the duty cycle to its maximum (11%), which was limited by the vacuum. With further conditioning, the duty cycle can probably be increased further to or even above the design value of 15%:

7th measurement, high power, high duty cycle (11%): pulse period 9 ms, pulse length 1.0 ms, frequency 351.9777 MHz

pick up	damping [dB]	detector	voltage [mV]	power [kW]	precision [%]
forward	66.74	3	376	312	± 17
tank 1 [waveguide]	60.3	R1	780	320	± 15
tank 2	59.7	R2	874	340	± 15

The temperature in the drift tubes increased from 28 degrees Celsius to 50 degrees Celsius.

decisions taken:

new actions

updated ActionListRF

minutes by Frank Gerigk

-- FrankGerigk - 12 Nov 2007

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