

DTL structure meeting 30.01.2009

S. Ramberger, R. Wegner, G. DeMichele, F. Grespan

DTL Power Coupler Simulations

- Power Coupler 3D simulations with MWS and HFSS.
- Reduced DTL Volume simulated (7th and 8th cell).
- Installed WaveGuide geometry (short at $\lambda_{guide}/4 = 31$ cm from the Iris centre).
- Discussion about the method described by Balleyguier in <http://accelconf.web.cern.ch/accelconf/I98/PAPERS/MO4037.PDF> , using 2 Eigenmode simulations in order to calculate the Qext.
- good agreement (< 5%) between the simulation methods:
 - ◆ MWS:
 1. "Balleyguier" method
 2. Eigenmode solver for Qext calculation
 - ◆ HFSS:
 1. "Balleyguier" method
 2. Driven Modal solver for VSWR calculation
- Scaling the simulations to the whole DTL volume: simulation with end walls PEC, Tank and Drift-Tubes dissipative; then scaling with the cell number; finally add the end walls to the total dissipated power.
- Check the possibility to keep the PIMS Coupler Geometry for the DTL tanks: varying 1st the Wguide short length, 2nd the coupler height, 3rd the iris dimensions.

DTL Circuit Model

- the geometrical estimation of the Coupling Capacitance (between Drift-Tubes and Tank) makes sense with the frequency fitting (within a factor 2).
- the Stem circuit has been included in the model and the theoretical dispersion curve fit the measurements.
- Post Couplers: simulations show the PC field not to interact with Stems -> maybe the PC circuit can avoid the Stems.
- results of a circuit without coupling between PCs: dispersion curve fit the 1st and the 2nd frequency, but not the next.
- look at the fields and currents of the 3D simulation to understand the Coupling between PC (inductance? Mutual inductance? Both?).
- simulations with different number of PCs per cell, different Drift-Tube length, etc:
 - ◆ How does the PC's Dispersion Curve vary?
 - ◆ How does the effect of the PC vary on the axis?
 - ◆ Is it possible to define a "Number_of_PC/meter" in case of different Drift-Tubes Length?

DTL RF Power Test

- Directivity of the directional coupler is fundamental to know, in order to correctly distinguish $P_{forward}$ and $P_{reflected}$.

-- FrancescoGrespan - 04 Feb 2009

This topic: SPL > Minutes30January2009

Topic revision: r1 - 2009-02-05 - SuitbertRamberger



Copyright