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Meeting on Debuncher Cavity, 5. May 2010

present: A.K. Bhattacharyya, P. Baudrenghien, M. Vretenar, A. Lombardi, L.M. Hein, R. Wegner, J. Tuckmantel, R. Garoby, C. Carli,

AKB presented first results for the energy ramping with the last 2 PIMS cavities. He studied cases with 20 and 40 us long periods, using 20 or 40 mA average current. For a strict triangular voltage raise the klystron was driven into saturation in all cases, although the 40 us, 20 mA was the least critical. In order to prevent saturation of the klystron, and in order to improve the simulations the following conclusions/actions have been agreed upon:

- Lowering the linac energy by 1 or 2 MeV, lowers the "nominal" voltage for the last 2 PIMS cavities. This will give more power margin for performing the voltage swing with these cavities. FG/RW will provide power and voltage values to PB and AKB and AKB will repeat the simulations with these values.
- CC will study the difference in PSB performance, when assuming 20 or 40 us periods. He will also look at the impact of slightly lower average linac energy.
- AL confirmed that a 30 mm bore radius in the debuncher cavity is enough to keep beam loss under control. This may require the installation of further steerers, or schemes to reduce the dispersion in the area of the debuncher cavity.
- AL confirmed the nominal voltage of 0.7 MV and the max. voltage of 0.9 MV for the debuncher cavity. The voltage margin is needed in case a lower current is transported, which will experience less debunching (in phase) between the end of Linac4 and the debuncher cavity.
- RW showed a table with the dependence of shunt impedance on the aperture radius for a 7-cell cavity. He will provide updated cavity specs to PB and AKB.

aperture radius	ZTT	Power for 0.7 MV	Power for 0.9 MV
25 mm	25.4 MOhm	12.5 kW	20.6 kW
30 mm	23.3 MOhm	13.6 kW	22.4 kW
35 mm	21.4 MOhm	14.8 kW	24.4 kW

- RW and AKB will exchange ideas on a possible increase of the coupling constant (power coupler to cavity) for the debuncher cavity.
- AKB will use a sine-profile for the voltage to evaluate the difference to the triangular voltage shape.
- AKB will extend the simulation model to include frequency detuning in the cavity to compensate for beam loading.

The next meeting will take place on Thursday, 3d June, 14:30 in 354-1-001

-- FrankGerigk - 07-May-2010

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