

**REPORT FROM WORKING GROUP ON
RF DEFLECTORS**

A. Gallo

WORKING GROUP ON RF DEFLECTORS

PARTECIPANTS:

- CORSINI R.	- MILLICH A.
- GALLO A.	- SHULTE D.
- GHIGO A.	- SYRATCHEV I.
- GESCHONKE G.	- THORND AHL L.
- JENSEN E.	- WILSON I.

DISCUSSION REPORT

A) BEAM LOADING IN THE COMBINER RING DEFLECTORS:

- ➔ Evaluation of the beam loading for motion in the vertical plane, where the optical functions and the tune may be far from optima. The model of the deflecting vertical wake has to be worked out (mode detuning, TW or SW ?)
- ➔ The RF phase and amplitude equalization of the two kickers to avoid residual betatron oscillations is very important. Figures of the equalization stability requirements have to be defined.
- ➔ Simulate trains with different initial conditions for even and odd bunches (memory of the loading in the delay loop)
- ➔ Simulate time displacement of the injected bunches and finite bunch length.
- ➔ Simulate the effects of the transverse wake coming from the HOMs.

- How to optimize experimentally the beam alignment respect to the structure and keep it under control to avoid emittance growth? It is desirable to have 2 beam profile monitors (SLMs) with $\pi/2$ phase advance to minimize the spot in the phase space.
- Remaining open-minded respect to the option of using a SW cavity as RF deflector.

B) RF DEFLECTOR FOR THE DELAY LOOP:

- Start beam loading simulations considering either TW or SW options (design more flexible since the power source has to be defined).
- Head and tails of trains (3 GHz micro-structure) may “collide” at the deflector center. Is someone worried about? (after discussion this point does not seem to be relevant).

C) CONSTRUCTION OF A PAIR OF 3 GHz LENGELER STRUCTURES:

- Everyone is convinced that's worth constructing a deflector pair to start take confidence with technological aspects, to use them in the EPA experiment and (hopefully) even in CTF3 machine.
- The mechanical design can be scaled from existing drawings.
- The manufacturing and brazing can be done in different sites.
- CERN group will support this work with its expertise (L. Thorndahl contact person).
- A budget of 100 M£ (~ 80 kCHF) is realistic (any engineering included).