

Calculations On Bunch Formation With Two RFQ's (continued)

H. Deitinghoff, H. Klein, M. Schempp

T. Weis IAP Frankfurt/M.

CERN LIBRARIES, GENEVA



CM-P00050990

- Since VIIth EHF-Workshop more computational work on beam dynamics,
goals: improvement of beam performance,
 higher overall transmission.
 - RFQ2: no changes of data in the 'yellow' book
 - RFQ1: bunch compression bit slower
 lower phase advance ϕ_{0e} (75°, 80°)
 → lower electrode voltage (~10%)
 lower input energy (40, 42, 45 keV)
 length increase of ~10-15%
- IXth EHF-Workshop S. Margherita

Results:

Drift length between both RFQs $< 5\text{ cm}$

Zero current transmission: 78-85%
 $\epsilon_{in}^{\dagger}(\text{norm}) : 0.2 - 1 \pi \text{ mm mrad}$.

● Transmission at design current: 56-62%
 $\epsilon_{in}^{\dagger}(\text{norm}) : 0.3 \pi \text{ mm mrad}$.

Emittance growth in RFQ1 reduced by a factor ~ 2 .

Empty buckets:

● Two ways losing particles in the RFQ:

a) transverse losses, particles hit electrode

b) longitudinal "losses", out of phase with rf-field, leaving the bunch \rightarrow following buckets, stable phase again?

Conclusion:

Empty buckets can be kept free from particles with design output energy, but particles with much lower energies (\sim input energy) are present at the output

• Lost in the Alvarez ?

Tolerances ?

Experimental work should start.