REPORT FROM WORKING GROUP ON OPTICS

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2/11/2000

Beam Optics WG

1/ Transfer Lines

a) Linac ⟶ Combiner Ring 1st priority

Installation around 2nd quarter 2003

Break-down of installation phase (initial) in 2003 needed

⇒ <u>Specs</u> for magnets, Vacuum system, diagnostics by end of 2001

— Agreement upon requirements

$$0 \lesssim \sigma_{z\,rms} \lesssim 3\ mm\ (max.)$$

Soft minimum (nonlinear effects) Linked to impedance

With Assumed linear correlation $\frac{\Delta p}{p} \simeq 1\%$

$$R_{56} = \pm\ 0,15\ (max.)$$

Limits re-considered if design shows difficulties

— Needs of "stretching" chicane before delay loop related to CSR effects in the loop : investigations

⇒ Tr. Line with 2 triplets distant enough to contain a chicane (installed or not)

— Present results based on prelim. design

<u>Re</u>matching with correct magnetic lengths needed

— <u>Recommendation</u> : (zero-G) dipoles from EPA

quads from EPA (DAΦNE-like quads in option)

b) Extraction from Combiner Ring

Installation around 3rd quarter 2003

Break-down of installation phase needed

⇒ Specs by beginning 2002

- Requirements

$\sigma_{z\,rms} \approx 0.4$ mm nonlinear
0.0 linear

With an assumed correlation $\Delta p/p \approx 1\%$

$R_{56} = 0.26^{30}$ (max.)

Compression only.

A part of it can be fixed
+ a tunable part (?)

Layout of the line ⟶ Space required

c) Spectrometer after the linac (PC)

d) Deceleration test area

first, at the position of chicane
with provisional dump at tunnel-end

second, move it after the first bend
of transfer line, with a dump
after a V-bend in the ring centre area

2/ Combiner Ring

Tight Tolerance on Circumference
⇒ end effects are important
Needs to know the fields point to point
in the X-z plane, in the end-areas,
with off-sets larger than considered for EPA

Formal requests from INFN:

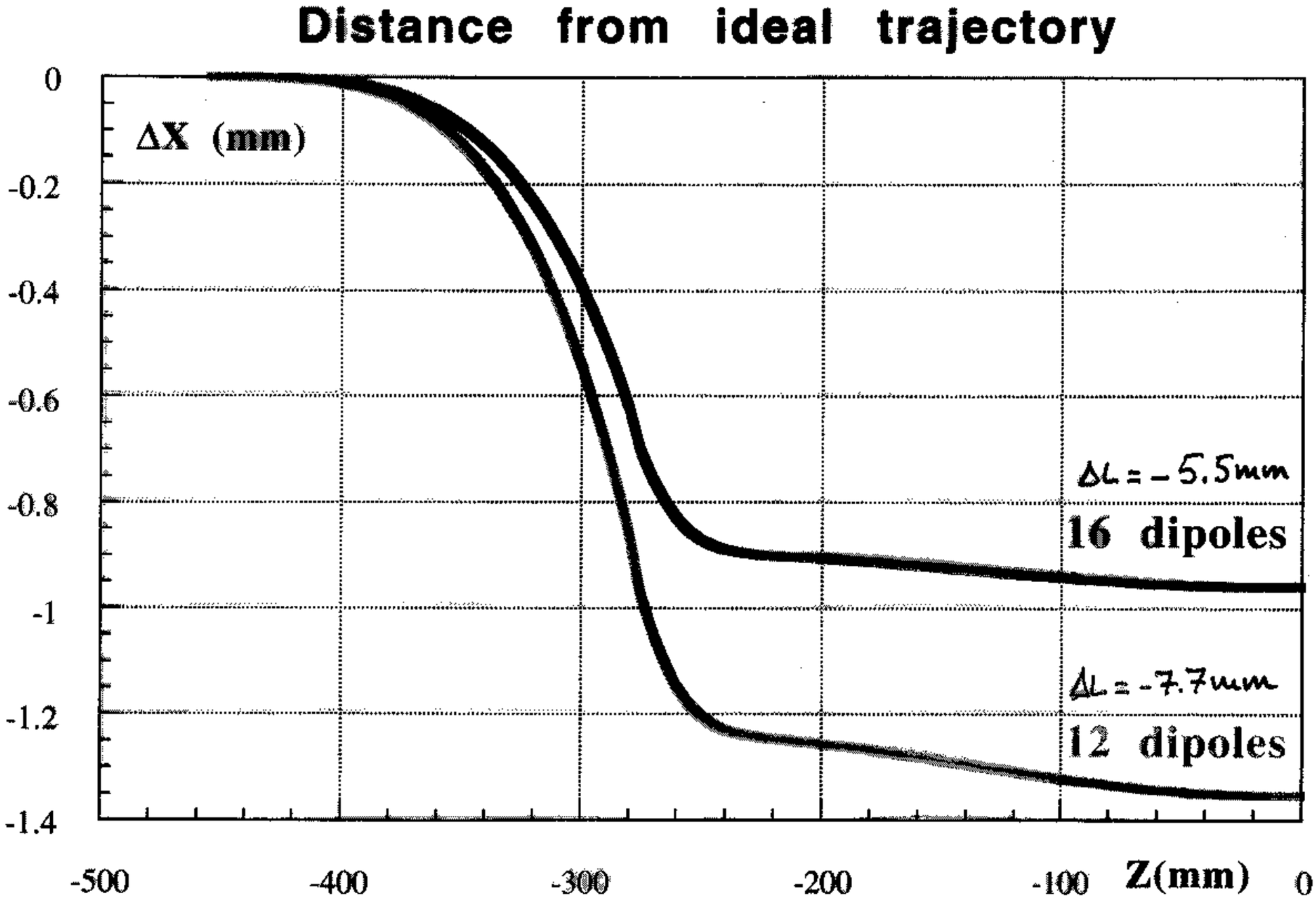
- measurements to map the field, x-z,
  > 6,5 cm off-set, of the dipoles w. gradient
- measurements to be done also for
  the dipoles w/o gradient in view of their
  use in transfer-lines (or delay-loop ?)

3/ Delay Loop

Comes at beginning of 2004
⇒ Specs by end of 2002

Dipoles : to be built like EPA ones
Quads : rebuilt DAΦNE-like, 30 cm long

To be done: diagnostics requirements
check CSR effects
Possible further optimisation of optics
8 dipoles : D_x too large
16 " : many indep. components
Can we simplify with 12 dipoles


Distance from ideal trajectory
ΔX (mm)
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
ΔL = -5.5mm
16 dipoles
ΔL = -7.7mm
12 dipoles
-500
-400
-300
-200
-100
Z(mm)
0