Short FF optics for ATF
very preliminary

Andrei Seryi
23 September 2004
FFIR facility at ATF

- Make use of ATF small emittance beam to achieve $\sigma_y \sim 36\text{nm}$

The extracted beam is assumed to have 1.54 GeV energy, invariant emittance of $\gamma \varepsilon_x = 1 \times 10^{-6} \text{m}$ with $\varepsilon_x / \varepsilon_y = 100/1$ and energy spread of $\delta = 0.1\%$ (Gaussian distribution). The beam sizes are expected to be $\sigma_y^* = 36.8\text{nm}$ and $\sigma_x^* = 3.42\mu\text{m}$ with no error at FP by the SAD tracking simulation. Detailed investigation

**FFIR TEST FACILITY**

TOSHIAKI TAUCHI
ATF2 GROUP

KEK, High Energy Accelerator Research Organization,
1-1Oho, Tsukuba-shi, Ibaraki-ken, 305-0810, Japan.

ATF FF test optics, $L^* = 2\text{m}$,
S.Kuroda, T.Tauchi, et al.
NLC BDS

1st IR BDS, 250 GeV optics

Betatron Collimation

Final Focus

Final focus

Andrei Seryi
Short FF Optics
very preliminary

Optics with $L^*=1\text{m}$, and IP $\beta_x=4\text{mm}$, $\beta_y=0.1\text{mm}$
(same chromaticity as present ILC parameters)

Andrei Seryi
Andrei Seryi

Parameters used
\( \gamma_{\varepsilon_x} = 3 \times 10^{-6} \text{ m} \), \( \gamma_{\varepsilon_y} = 3 \times 10^{-8} \text{ m} \), \( E = 1.54 \text{ GeV} \)

So far optics is tuned with
\( \beta_x = 15 \text{ mm} \), \( \beta_y = 0.1 \text{ mm} \)

Further improvements are possible

nominal IP size: \( \sigma_x = 3.86 \text{ \mu m} \)  \( \sigma_y = 31.6 \text{ nm} \)

Tracked size with \( \sigma_E = 0 \):
\( \sigma_{x0} = 3.85 \text{ \mu m} \)  \( \sigma_{y0} = 34.7 \text{ nm} \)