FFIR Test Facility

T. Tauchi
KEK
ATF2 Collaboration

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Goals

(1) Final focus test beam at ATF

- experimental verification of Pantaleo's optics
- demonstration of 30nm focus with $\sigma_x/\sigma_y=100/1$
- establishment of tuning methods
- nano technology of BPM, Shintake monitor
- final focus quadrupole magnet in the support tube
- beam halo studies by "octupole optics" etc.
Goal continued

(2) Nanometer stabilization of final doublet
- one final doublet and nano-BPM at IP
- for the demonstration
- support tube structure;
  role of a central CFRP tube
- nanometer position measurements based on
  laser interferometer (QPD, Optical anchor)
- nanometer stabilization with active movers
- inertial sensors
- fast feedback system at nanometer level
Option: warm machine

(1) Test facility for photon collider

- Laser facility for LC specifications
  - Laser: 1.3J/pulse with a spot size of 3um,
    192 pulses/1.4ns at 150Hz
  - Optics at IP

- Study of "strong" QED
Final Focus system (35m)

PLC Test Facility

Klystron Modulator
NanoBPM collaboration at ATF
KEK, SLAC, LLNL and UK, 2003

Establishment of nano-meter resolution (goal=2nm)
March, 2004 ~ June, 2004

Phase-I: Stabilization of two isolated systems
October, 2004 ~ June, 2005?

Phase-II: Fast feedforward/feedback tests
October, 2005 ~ June, 2006?

Demonstration of nanometer stabilization at IR.
Over view of KEK Nano BPM
LLNL/SLAC system
45cm dia., 62cm long tube
supported by 4 linear actuators
on a girder; No active mover

NanoBPM

KEK system
10cm thick, 150cm long reference bar;
each BPM is set on active movers, which
are controlled by laser interferometers

Stabilization between two systems by Optical Anchor as well as
Inertial Sensors; FEATHER/FONT at the 2nd phase.