DR/BDS/DUMP group meeting (03/01)

Attendees : Philip Burrows, Angeles Faus-Golfe, Kiyoshi Kubo, Thomas Markiewicz, Toshiyuki Okugi, Ben Shepherd, Nobuhiro Terunuma, Akira Yamamoto, Mikhail Zobov

2023/03/14

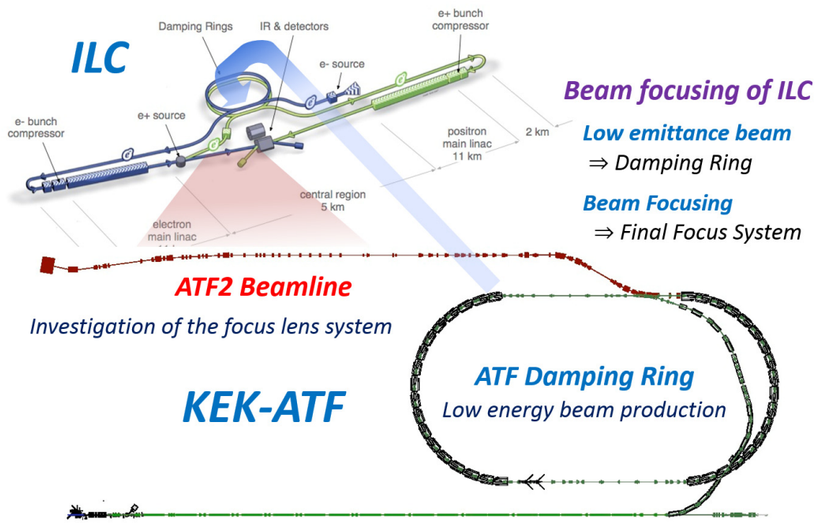
Toshiyuki OKUGI, KEK

IDT WG2 meeting

Introduction of the studies at ATF2 beamline

ATF2 Project

Final focus test with ATF low emittance beam.
ATF2 project was proposed at 1st LCWS (2004 November).



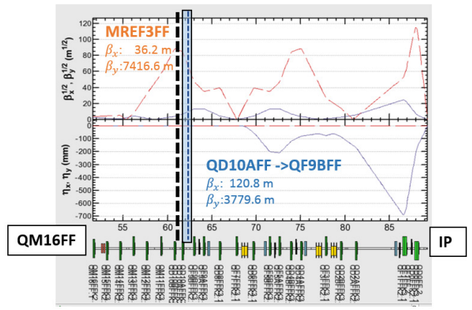
Beam focusing of ILC

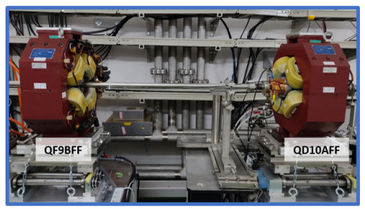
Low emittance beam
⇒ *Damping Ring*

Beam Focusing
⇒ *Final Focus System*

Wakefield test station in ATF2 beamline

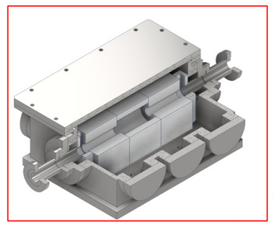
by Y. Abe





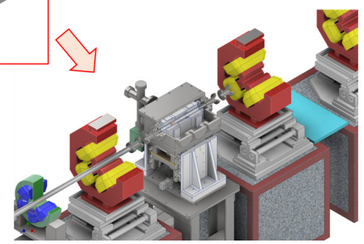
Subject of the study

- ✓ Minimization of wakefield effects on ATF2 beamlines
- ✓ Development of vacuum components to reduce wakefield effects



Preparing a wakefield test station

The vacuum chamber will be installed in ATF2 beamline in this autumn.

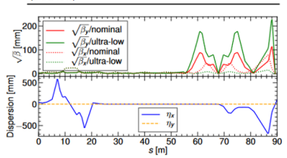


Ultra-low beta optics study at ATF2 to investigate of the correction of higher aberration

by R. Yang at ATF review 2020

- ◆ 0.25β_y* optics to demonstrate the tightest focusing possibility with a higher chromaticity beyond ILC & approaching CLIC
- ◆ Exploring the uncharted chromaticity territory; pushing the limits of ATF2

	L^* [m]	β_y^* [μm]	Chromaticity (L^*/β_y^*)	σ^*_y [nm]
CLIC	6	120	5x10⁴	1
ATF2 (nominal)	1	100	1x10⁴	37
ATF2 (ultra-low)	1	25	**4x10⁴**	**23**



Before 2016
$10\beta_x^*0.5\beta_y^*/25\beta_x^*$ $0.5\beta_y^*$

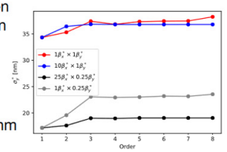
51 nm (2016)

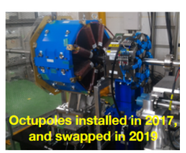
2016-present
$25\beta_x^*0.25$ β_y^*

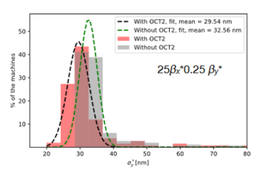
50 nm (2019)

Future
$1\beta_x^*0.25$ β_y^* with **octupoles**

- ◆ 3rd-order terms become dominating when entering sub-25 nm region! —> correction using octupoles
- ◆ Two octupoles (larger & small, K_3L= 740 and 90 m^{-3}), fabricated by CERN, have been placed in the FFS
- ◆ Higher probability of obtaining a sub-30 nm beam size thanks to the octupoles



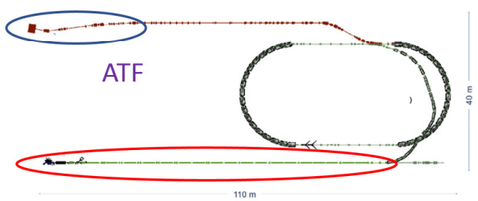




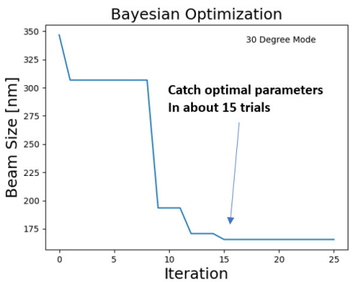
Bayesian Optimization @ATF

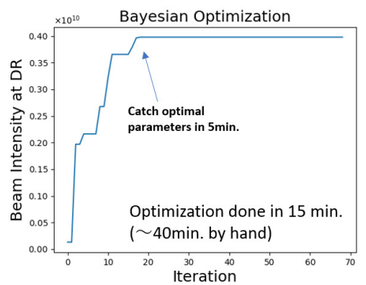
by M. Kurata

- Final Focus: Nano-beam tuning for the ILC
  - **Simultaneous optimization of multiple parameters**
    - Search for better parameters, including correlation
    - 3-parameter tuning: can obtain optimal value
    - Aiming for small beam by adjusting more parameters simultaneously



- Linac: Beam transportation to Damping ring
  - **Maximize transport efficiency to the damping ring**
  - Realize the auto-parameter optimization





Announcement of ATF3 kick-off meeting

March 8-9, 2023

https://indico.cern.ch/event/1259176/

WEDNESDAY, 8 MARCH

09:00 → 12:30 **Current status of ATF2 and Perspectives for ATF3 (talks)**

- 09:00 **Welcome and objectives** — 15m
  Speakers: Dr Angeles Faus-Golfe (IJClab IN2P3 CNRS-Université Paris-Saclay (FR)), Steinar Stapnes (CERN)
- 09:15 **Current and near future operation plan and upgrade status** — 30m
  Speaker: Nobuhiro Terunuma
  ATF3-kickoff-Terunu... ATF3-kickoff-Terunu...
- 09:45 **The IPBSM and other monitors upgrade** — 30m
  Speaker: Dr Alexander Aryshev (KEK)
- 10:15 **Coffee Break** — 30m
- 10:45 **ATF2 runs and plan for coming years** — 30m
  Speaker: Toshiyuki Okugi
  ATF_okugi_2023030...
- 11:15 **EAJADE and perspectives ILC-IDT** — 30m
  Speaker: Steinar Stapnes (CERN)
  atf-kickoff.pdf atf-kickoff.pptx
- 11:45 **Questions and discussion** — 45m

12:30 → 14:00 **Lunch** — 1h 30m

14:00 → 15:00 **Free discussions between collaborators and preparation of contributions**

THURSDAY, 9 MARCH

09:00 → 13:00 **Contributions from collaborators (talks)**

- 09:00 **Tests on light yield of incoherent Cherenkov diffraction radiation at ATF2** — 15m
  Speaker: Andreas Schloegelhofer (Technische Universitaet Wien (AT))
  ATF2_collaboration_...
- 09:15 **IFIC plans and potential contributions to ATF2-3** — 15m
  Speaker: Nuria Fuster
- 09:30 **Beam feedback system current and future activities** — 15m
  Speaker: Douglas Bett (JAI)
  2023-03-09_ATF3-Ki...
- 09:45 **Ultra low beta* optics at ATF2: status and plans** — 15m
  Speaker: Andrii Pastushenko (CERN)
  ATF3_kick_off_mee...
- 10:00 **Realistic simulations and model identification** — 15m
  Speaker: Andrea Latina (CERN)
  ATF3_Kick_Off_Mee... ATF3_Kick_Off_Mee... ATF3_KickOff.pdf
- 10:15 **JAI@RHUL planned and potential contributions to ATF programme** — 15m
  Speaker: Alexey Lyapin (RHUL)
- 10:30 **Coffee Break** — 30m

12:00 → 12:30 **Closing and final remarks** — 30m
Speakers: Dr Angeles Faus-Golfe (IJClab IN2P3 CNRS-Université Paris-Saclay (FR)), Philip Nicholas Burrows (University of Oxford (GB)), Steinar Stapnes

Based on the future ITN activities for WP-prime-15