

# ***DR/BDS/DUMP group meeting (10/11)***

*Discussion based on the presentation material for ITN meeting*

Attendees : Rohan Dowd, Angeles Faus-Golfe, Toshiyuki Okugi, Tom Markiewicz,  
Ben Shephard, Nobuhiro Terunuma, Kaoru Yokoya

2023/10/31

Toshiyuki OKUGI, KEK  
IDT WG2 meeting

## Progress in DR

~2017
2018~2021
Pre-lab

**DR**  
Design based on experience with circular accelerators (4<sup>th</sup> generation SR) around the world

3.2 km circumference  
H/V 4 μ / 20 nm in 100 ms

**Inj./Ext.**  
Beam extraction demonstrated.

Fast kicker technology

LEBL

CERN-CLIC

Final design

Stable operation

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## Progress in Final Focus

~2017
2018~2021
Pre-lab

Tech. design completed  
Spec. almost achieved

Wakefield effects

Detailed design  
Stable operation demonstration

ATF achieved 41 nm (2016)  
(37nm=LC (7.7nm))

Distribution of bunch positions measured at IPB, with two-BPM FB off (green) and on (purple)

High-speed beam position control technology was also demonstrated.

ATF2 wakefield knobs system between BPM QD10BFF and QD10AFF

Ultra low- $\beta$  studies

Instrumentation R&D

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## WPP 12: System design of ILC DR

To achieve the **low emittances levels** required for ILC keeping **large dynamic aperture (DA)** values, the ILC DR system design needs to be improved and updated.

**Objectives:**

- Improved design by incorporating the **latest light source design and technologies.**
- Evaluation and optimization of the DA with a **more realistic modelling** of the quadrupoles including the **fringe field effects.**

ILC damping ring optics

Dynamic aperture for ILC DR (hard edge)

Modeling of the fringe field for SuperKEKB DR

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Dynamic aperture evaluation with fringe effect (SuperKEKB DR)

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## WPP 15: System design of ILC FFS

Based on the achievements of the ATF2 no showstopper for ILC has been found, **ATF3** plan is to pursue the necessary R&D to **maximize the luminosity potential of ILC.**

**Objectives:**

- wakefield mitigation strategies
- correction of higher-order aberrations
- training for ILC beam tuning

Wakefield test station

ATF2 beamline

Octupole magnets for higher-order aberration

Intensity dependence studies

Maximum search algorithms to be applied to beam tuning (Machine Learning)

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