PRESENT STATUS OF THE KEK INJECTOR UPGRADE FOR THE FAST BEAM-MODE SWITCH

M. Satoh, KEK for the Injector Upgrade (IUC) WG members
KEK Injector Linac:

- J-like shaped Linac (600-m-long)
- Injector for the four independent rings:
  - PF (2.5-GeV e-/ 0.1-nC) Twice/day
  - PF-AR (3-GeV e-/ 0.2-nC) Twice/day
  - KEKB HER (8-GeV e-/ 1-nC) Continuous Injection Mode (CIM)
  - KEKB LER (3.5-GeV e+/ 1-nC) CIM

M. SATOH/ KEK Linac Control
KEKB Injection (CIM)

• Frequent Switch of Linac Beam-Mode (parameters):

KEKB CIM Mode

- Many parameters should be changed.
- Timing
- LLRF Phase
- Magnet parameter
- etc.

• Beam-mode switch time should be drastically reduced for the KEKB CIM and PF Top-up.
Fast Beam-Mode Switch using
≡ Multi-Energy Linac Scheme ≡

- **Magnetic Field**:  
  - Common Parameter (Q and Steering magnets)

- **Fast Energy Adjustment**:  
  - Fast Control of Low-Level RF phase

![Beam-Mode Switch Diagram]

KEKB e- KEKB e+ KEKB e- KEKB e+ PF e- PF-AR e- PF e- KEKB e+

20-ms (50-Hz) RF pulse cycle

M. SATOH/ KEK Linac Control Linac2008
Subsystems R&D

e+ target with a hole for a fast switch between e- and e+

W crystalline target (Φ4.5 mm)

“Optics Design”

=>

“Design and Performance of Optics for Multi-energy Injector Linac”

Fast BPM-DAQ

Fast Timing System

Pulsed bend

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