



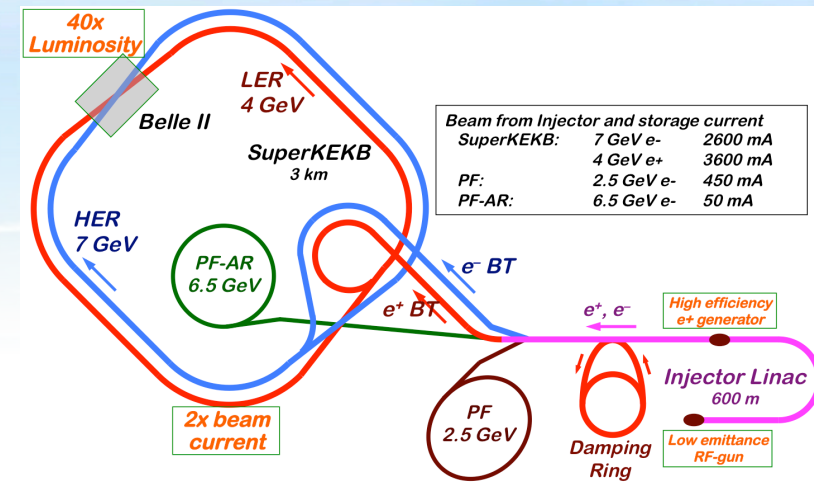
# Upgrade of KEK Electron/positron Linac Control System for the both SuperKEKB and Light Sources

K. Furukawa, Y. Enomoto, H. Kaji, H. Katagiri, M. Kurashina,  
K. Mikawa, T. Miura, F. Miyahara, T. Natsui, I. Satake, M. Satoh,  
Y. Seimiya, H. Sugimura, T. Suwada  
High Energy Accelerator Research Organization (KEK)

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# Multi-purpose injector linac

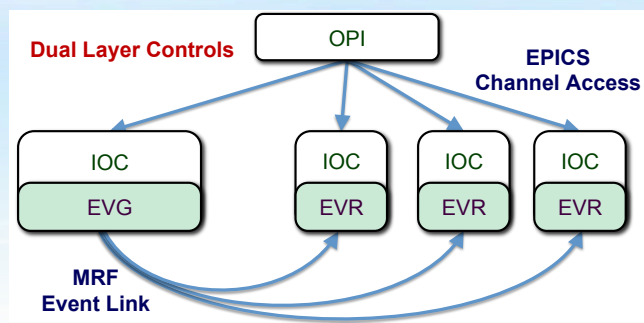
- 7-GeV electron 4-GeV positron injector linac at KEK has supported the both **particle physics** and **photon science** storage rings for more than 30 years.
- Natures of beam demanding approaches from those experiments are so different that the operation becomes tough to be planned, especially for construction and maintenance.
  - long-term integrated performance vs. short-term beam **stability**
  - continuous **improvements** vs. preventive planned maintenance
- The control system should help enabling the consistent operation.



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# Pulse-to-pulse modulation (PPM)

- Dual-layer controls based on MRF event controls and EPICS controls were employed in the last stage of previous KEKB project.
- Further improved for SuperKEKB with MRF/SINAP 3 x EVGs and ~100 x EVRs.
- Many PPM-capable pulsed devices were added.
  - 66 pulsed quad, bend, and corrector magnets with newly designed power supplies
  - LLRF drivers and monitors with IQ controls on FPGA and embedded EVRs
  - High-precision BPMs with wide-dynamic range, and beam wire-scanners indispensable for beam emittance management
  - Damping ring and main ring injection/extraction devices
- picosecond-level synchronization and dynamic operational configuration should be available



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