

# R&D Plan and applications

- Establish technology for laser pulse power accumulation in special, self-starting optical cavity with the high multiplication factor to achieve more than 10MW as the stored power.
- Study and optimize the Compton collision scheme for efficient X-ray and  $\gamma$ -ray generation.
- Study the dielectric wake-field acceleration structures including its radiation mechanisms in GHz-THz range for efficient energy de-chirping and possibly cooling of the relativistic electron beam to increase monochromaticity of the scattered Compton light.

## Applications

- Polarized Positron and Electron beam Generation.
  - Construction of future lepton colliders, including Higgs factories and  $\gamma$ - $\gamma$  colliders.
  - Upgrade SuperKEK-B injector and open-up possibility to study Pol.  $e^- - e^+$  collision physics within BELL-II collaboration.
- Advanced X-ray Imaging with fast polarization switching.
  - Compact X-ray source with wide possibilities to explore new areas of applied biology and solid state physics, like homochirality study and direct observation of a magnetic moment distribution in materials.
- Nuclear Physics by polarized gamma-ray.
  - Realization of a tunable polarized  $\gamma$ -ray source for experimental nuclear physics, for example nuclear resonance fluorescence study.

