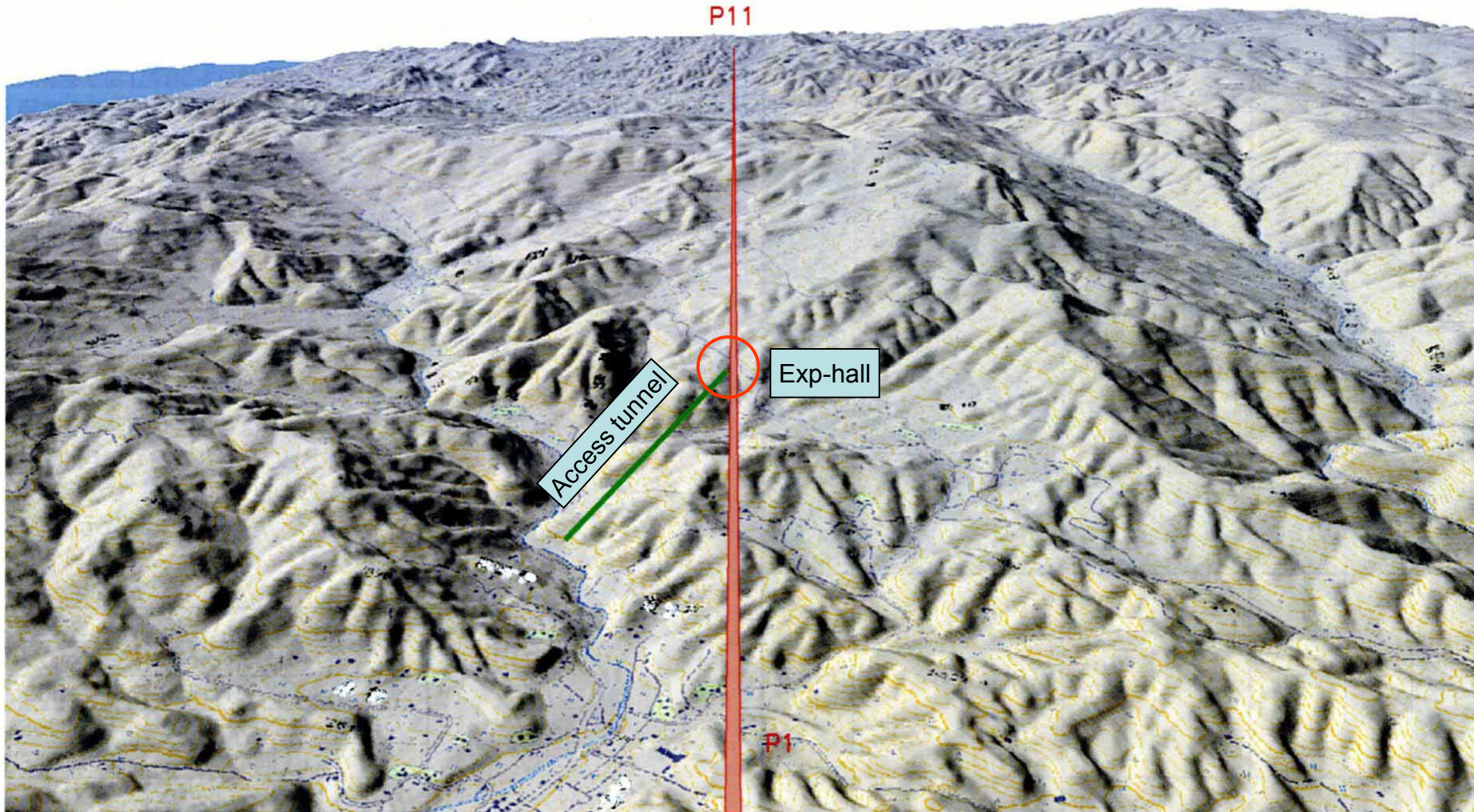


# Update of detector hall in mountain region

May 22, 2011  
@LAL-Orsay

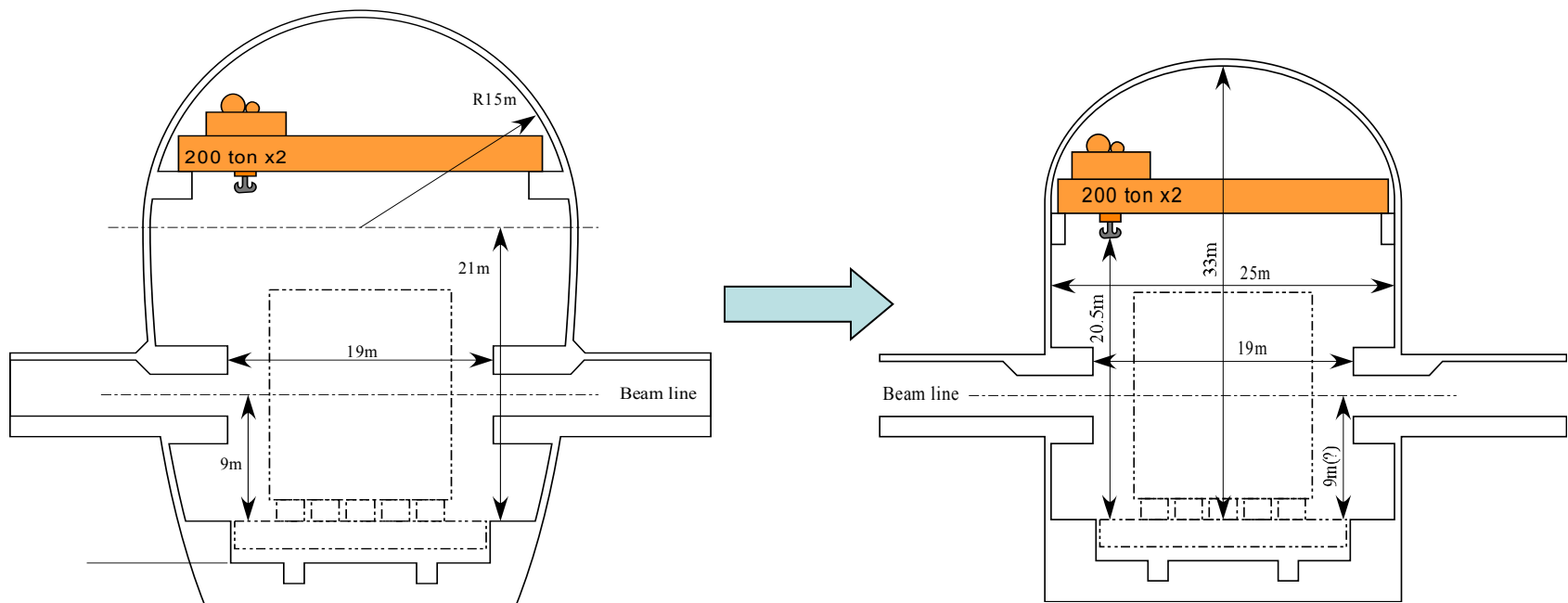
Y.Sugimoto

# Sample site



# Shape of cavern

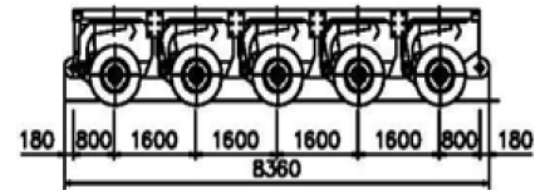
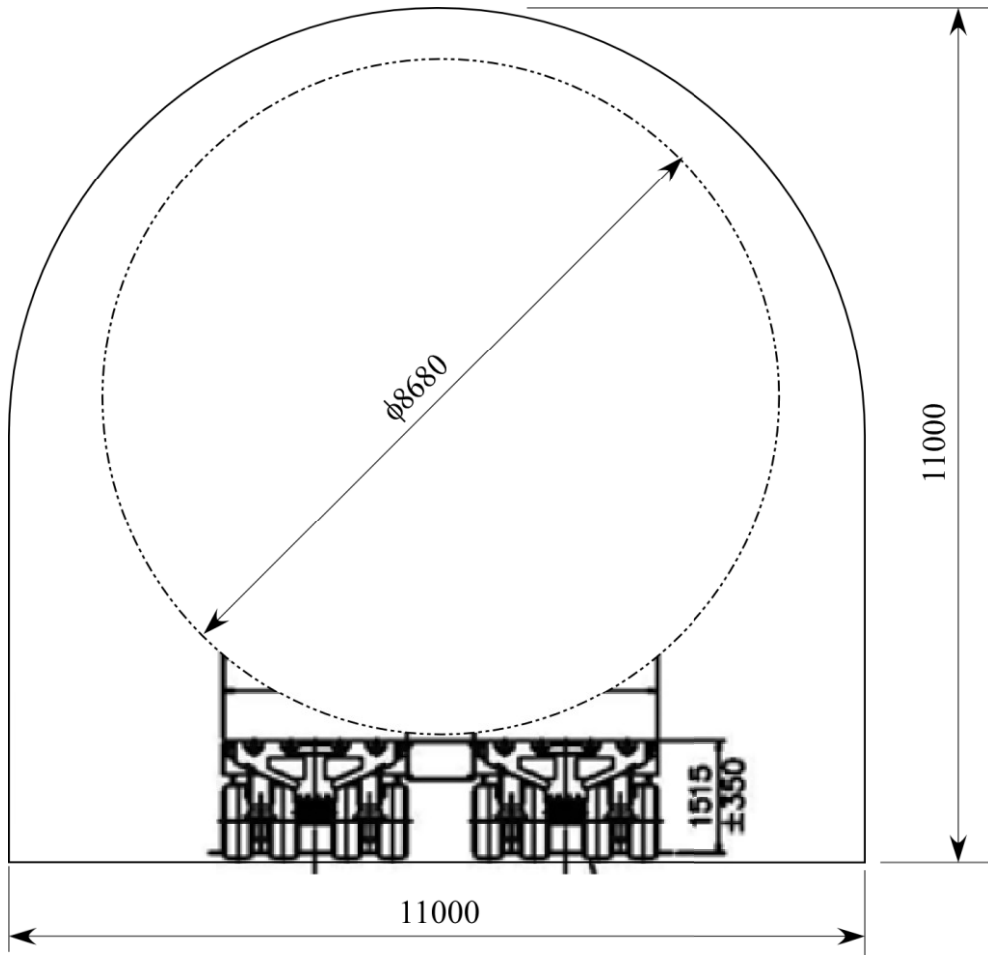
- Study of 2 sample sites in Japan
  - Both sites have very good geology of granite
  - Depth of the cavern is less than 300m
  - ➔ Shape of the cavern can be bullet shape rather than egg shape



# Access tunnel

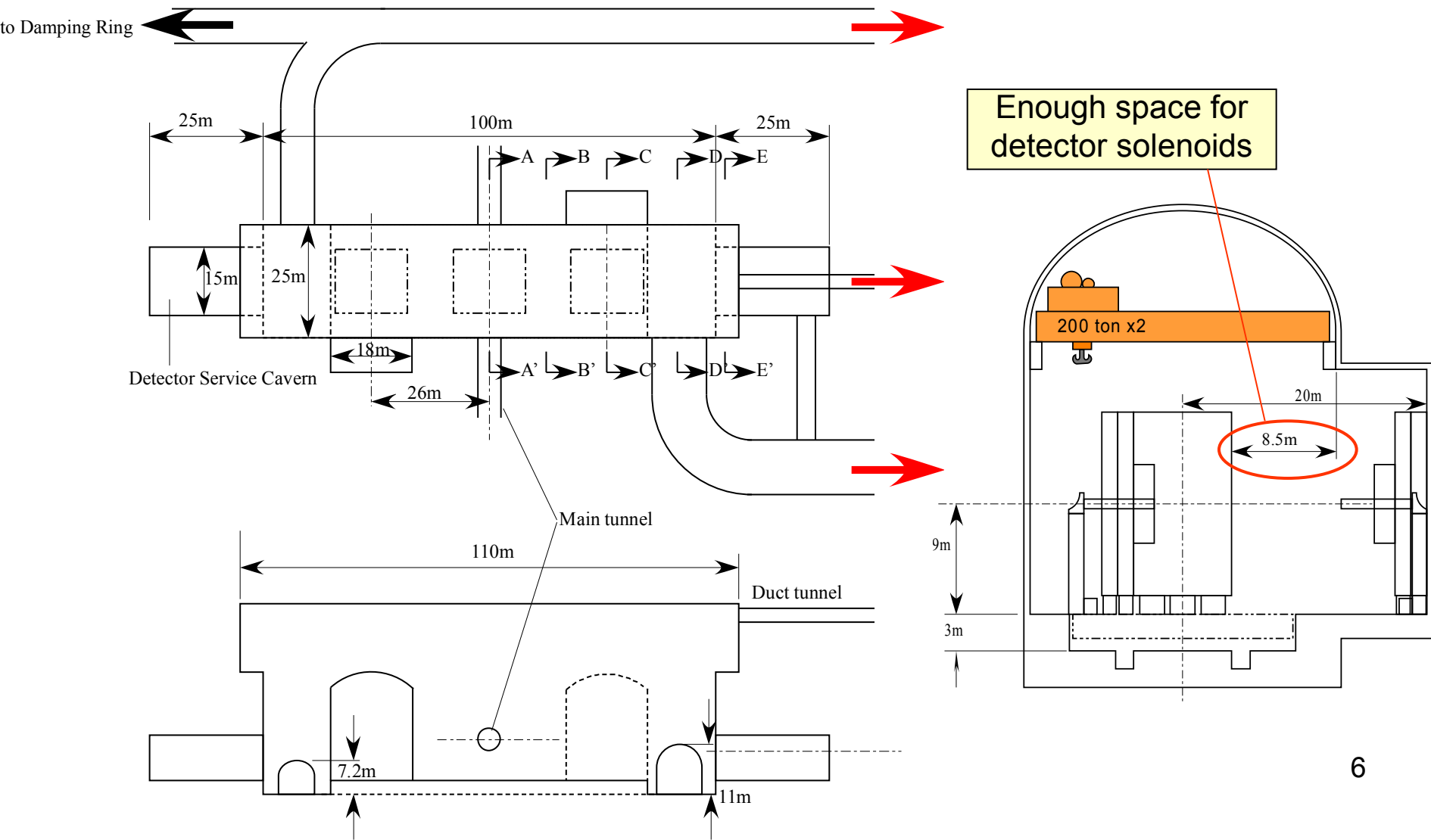
- Location of solenoid construction
  - In the cavern → larger cavern ( $\Delta L \sim 40\text{m}$ ?), smaller access tunnel
  - On surface → smaller cavern, larger access tunnel
  - Cost is similar for both cases, but on-surface assembly is more convenient and less risk
  - On-surface assembly with large ( $h=11\text{m}$ ) access tunnel
- Access tunnel to 2<sup>nd</sup> detector
  - It has to go underneath the BDS tunnel, and should not be so large
  - Smaller access tunnel for the 2<sup>nd</sup> detector (SiD?)
  - Solenoid of the 2<sup>nd</sup> detector should be carried through the larger access tunnel, and go through the area of the 1<sup>st</sup> detector
  - What is the minimum size of the smaller access tunnel (input from SiD)?
- Helium compressor for solenoids
  - He compressors can be placed in the large access tunnel
  - Distance between the detector solenoid and the compressor  $< 200\text{m}$  (?)
  - KEK cryogenic group (Y.Makida et al.) has joined this study

# Solenoid transport



- 225t/5axles  $\rightarrow$  450t with 2-trailers
- Capable of  $\sim 7\%$  slope

# Solenoid transport



# Other issues

- Detector service caverns
  - What is the required size to enclose detector power supplies, cooling plants for the detectors, power supplies and refrigerators for solenoids, etc?
- Beam line height?
  - To be decided in this workshop
- Do we need service tunnel and survey tunnel for accelerator?
- Can we share the access tunnel for detectors with accelerator (DR, BDS)?

# Earthquake

- Belle detector after 3.11
  - Bell detector was rolled out from the beam line and fixed to the ground
  - 32 fixing bolts (M22) have been broken by the earthquake, and Belle detector moved 6 cm on the rail
- How should platforms be supported on the occasion of big earthquake?
  - Move with the ground?
  - Isolated from the ground?

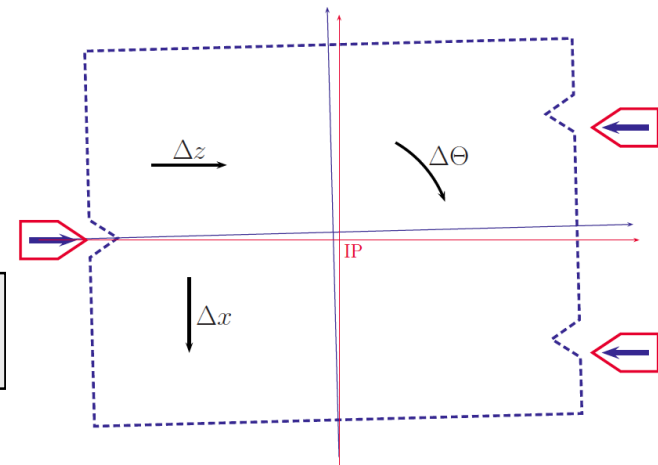
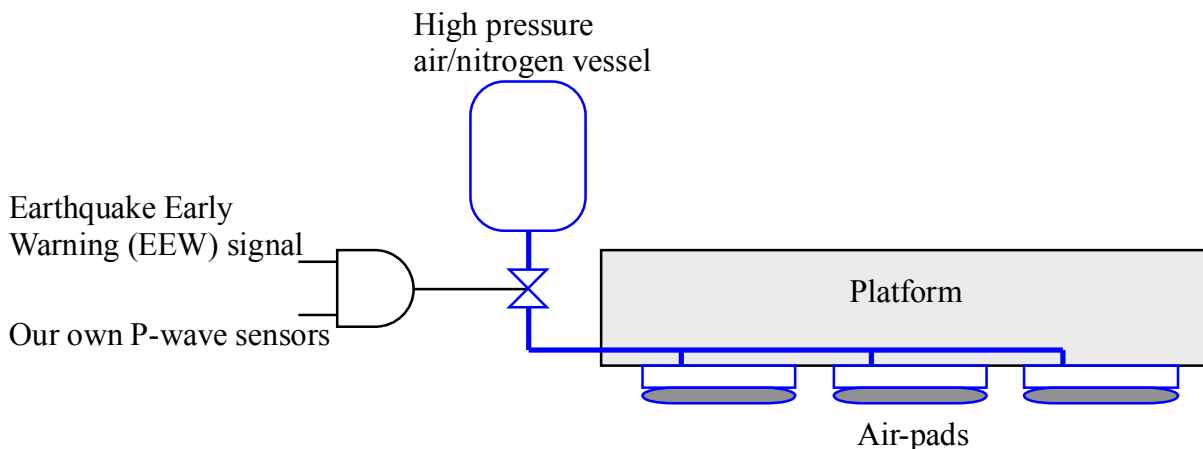


Seismic isolation support  
for buildings



# Earthquake

- Isolation from the ground can be achieved using air-pads, but
  - Enough gap between side wall is necessary
  - Positioning actuators should be retractable
  - Very flexible bellows should be placed between QD0 and QF1 to avoid damages to the inner detectors



# Towards DBD

- Impact of 3.11
  - Some collaborators of KEK who belong to facility group, cryogenic group, Acc. group are occupied with repairing works at KEK and JPARC
  - Hopefully, they will come back to ILC work by autumn
- In cooperation with the experts mentioned above, we will make designs necessary for the mountain site:
  - Underground cavern and the access tunnel
  - Detector solenoid/cryogenic system
  - Other utilities

backup

# RDR

