

# Update of detector hall in mountain region

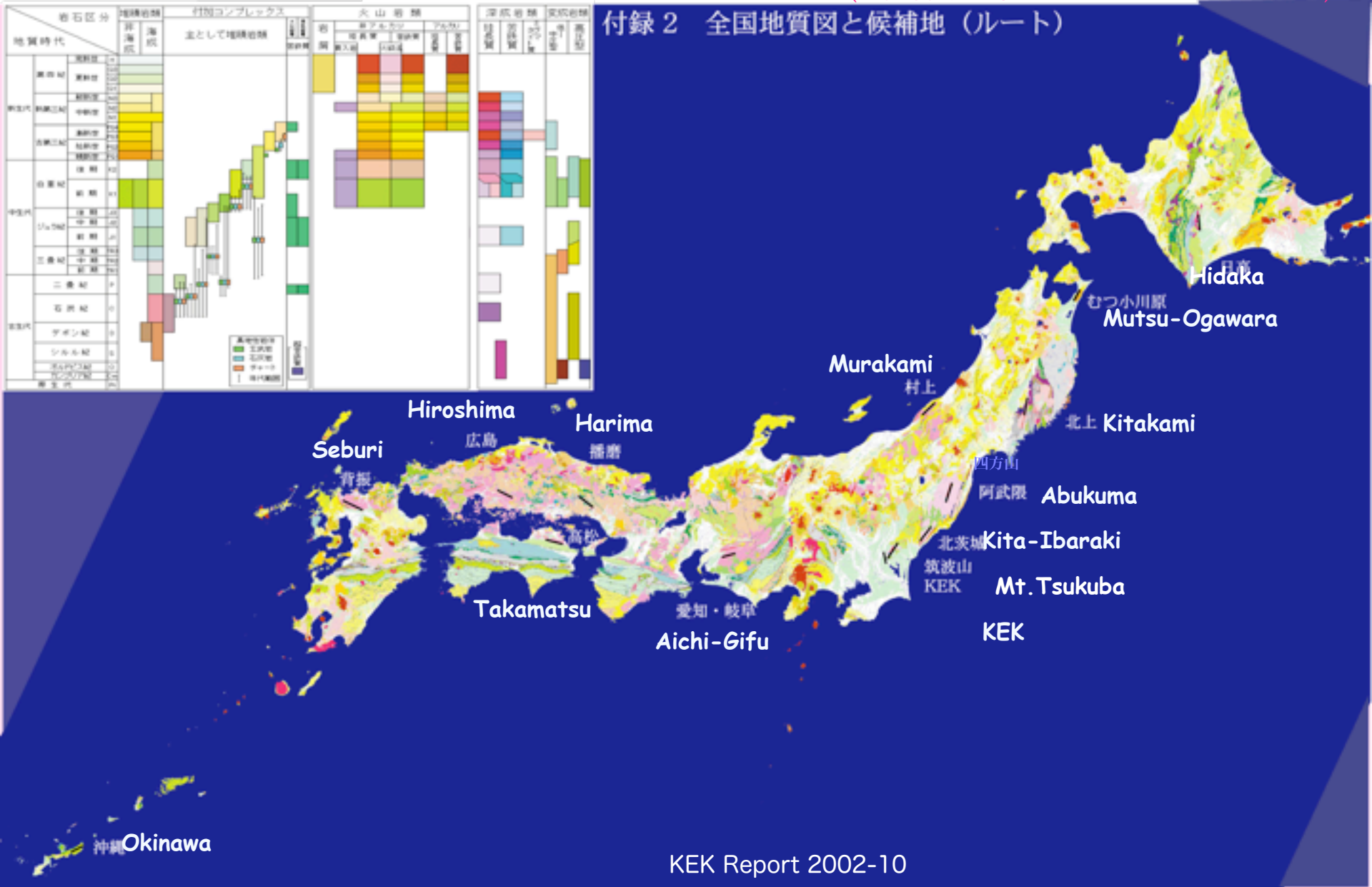
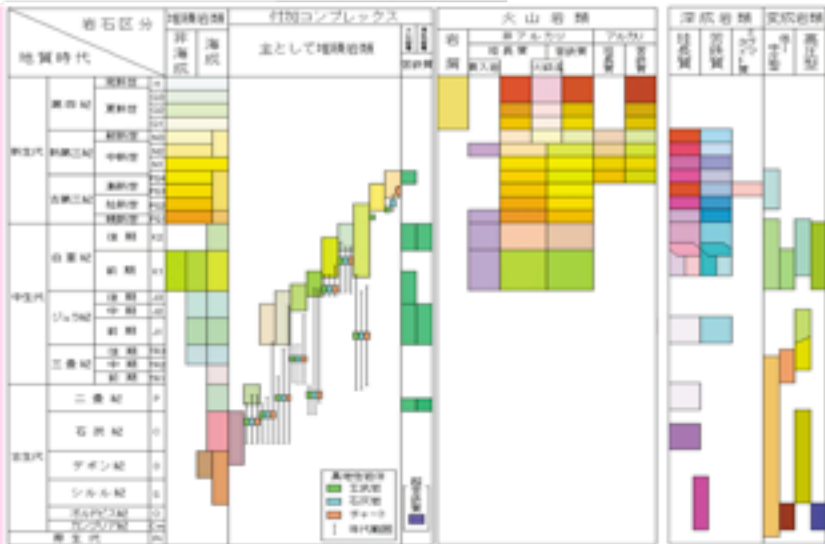
For ALCPG2011

Y.Sugimoto, T. Tauchi  
2011/3/20

# Japan Geology and Site Candidates

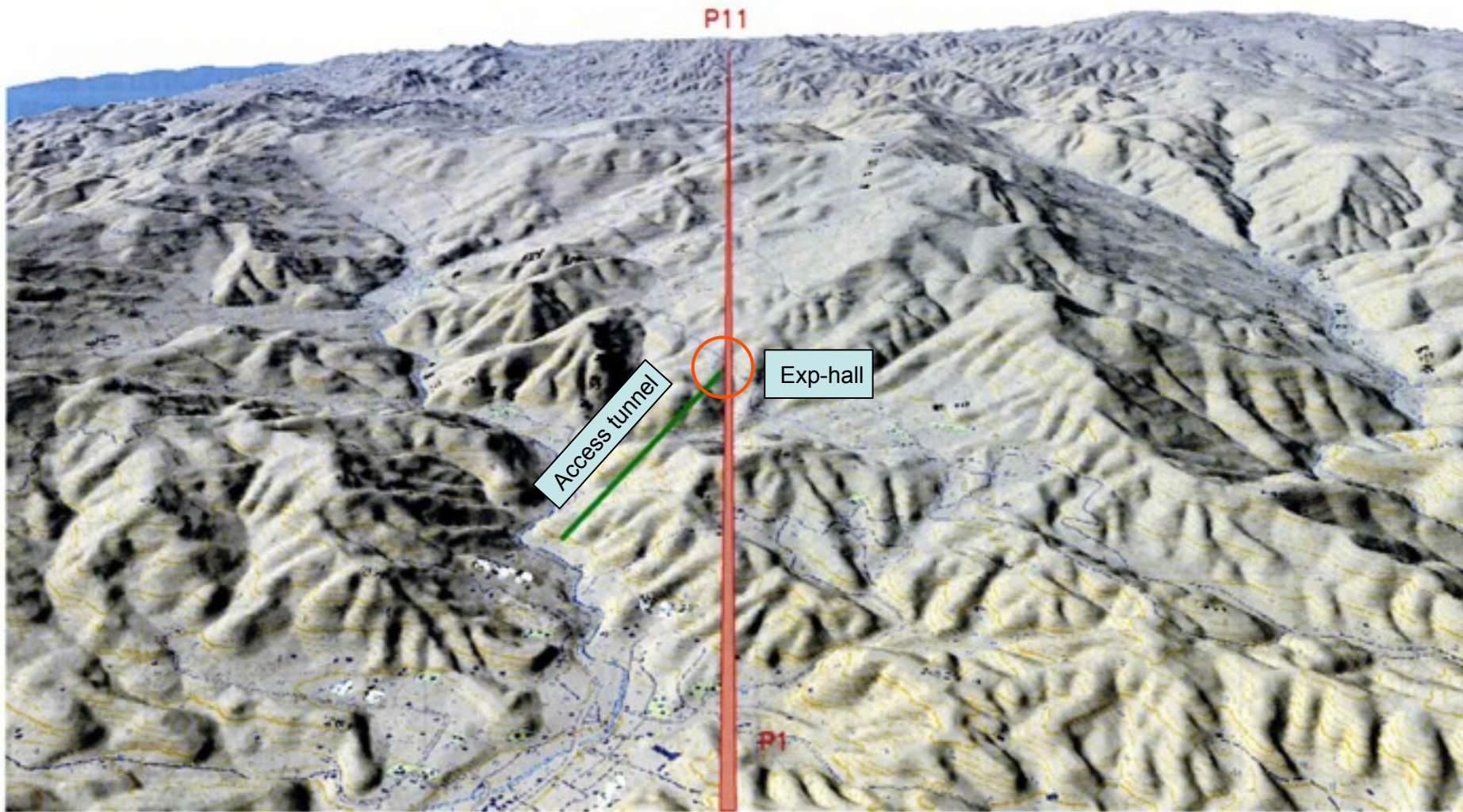
産業技術総合研究所・地質調査総合センター・「日本地質図データベース」利用  
(承認番号：第75300-20021108-001号)

付録2 全国地質図と候補地（ルート）



KEK Report 2002-10

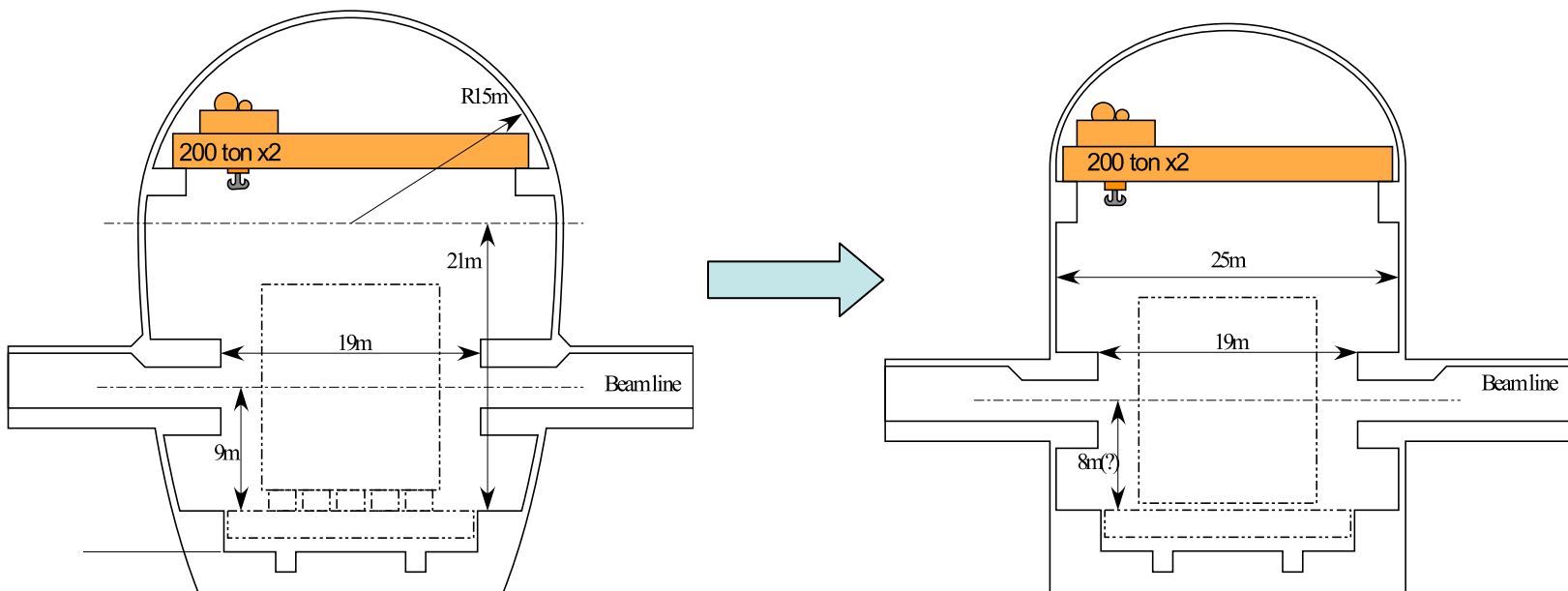
# An example of Asian mountain site



Y. Sugimoto, IWLC10, CERN/CICG, 8 Oct.2010

# Shape of cavern

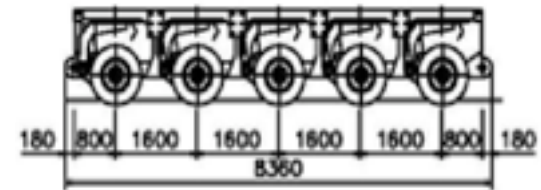
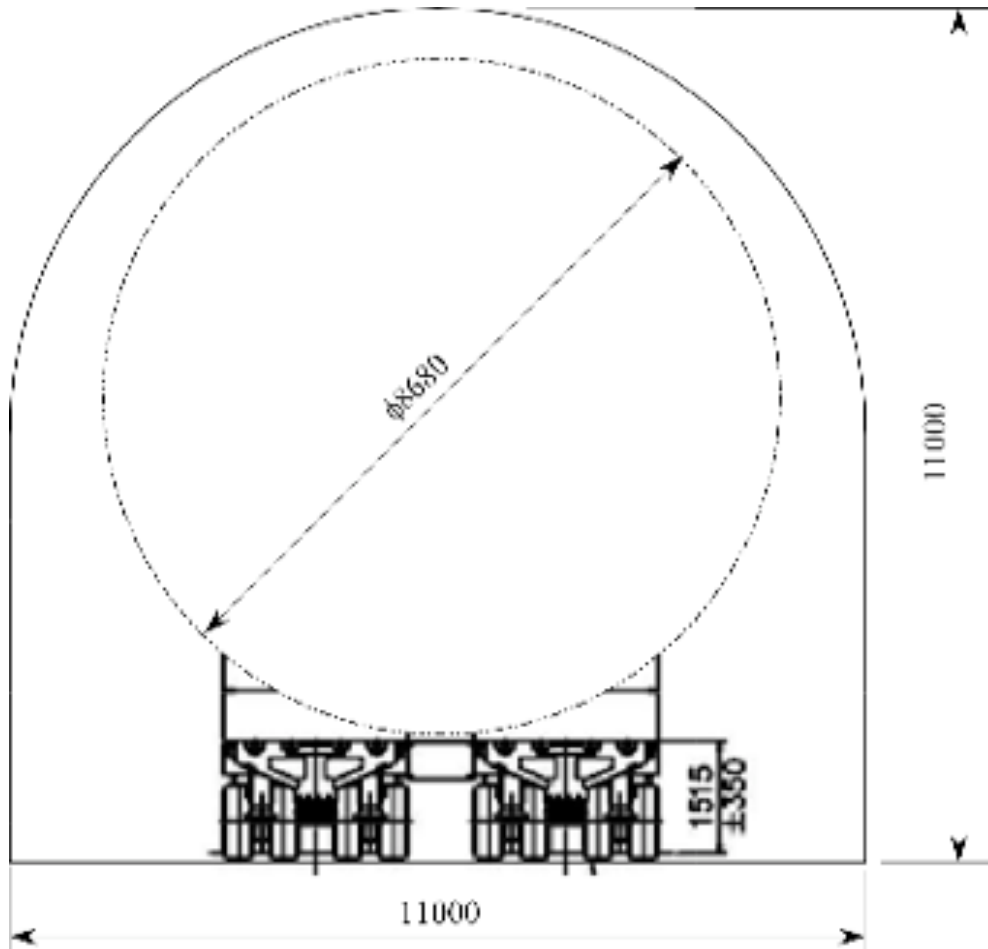
- Study of 2 sample sites
  - Both sites have very good geology of granite
  - Depth of the cavern is less than 300m
  - ➔ Shape of the cavern can be bullet shape rather than egg shape



# Access tunnel

- Location of solenoid construction
  - In the cavern → larger cavern, 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=11m) 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 larger access tunnel
  - Distance between the detector solenoid and the compressor < 200m (?)

# Access tunnel

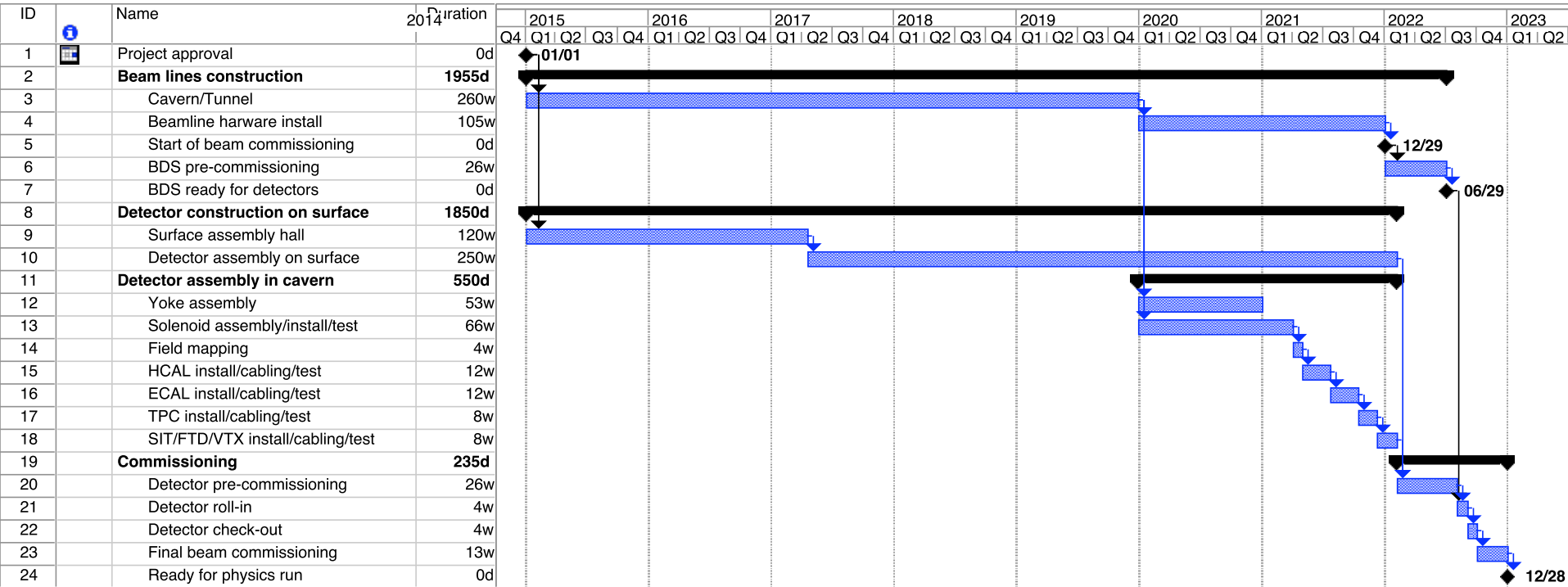


- 225t/5axles  $\rightarrow$  450t with 2-trailers
- Capable of  $\sim 7\%$  slope

# Detector assembly

- Assembly hall locates at the entrance of access tunnel where wide flat surface and wide roads exist
- Detector would be assembled to relatively small pieces (<100~200 ton) at the assembly hall, carried to the cavern through the access tunnel, and integrated to the large detector inside the cavern (Similar to “modified CMS style assembly” which was proposed by GLD group in 2006)
- Barrel iron structure would be divided in  $\phi$  (and R) direction, rather than Z direction
- Solenoid coil would be wound and assembled on surface
- Detailed study on the assembly method is necessary

# New modified CMS style



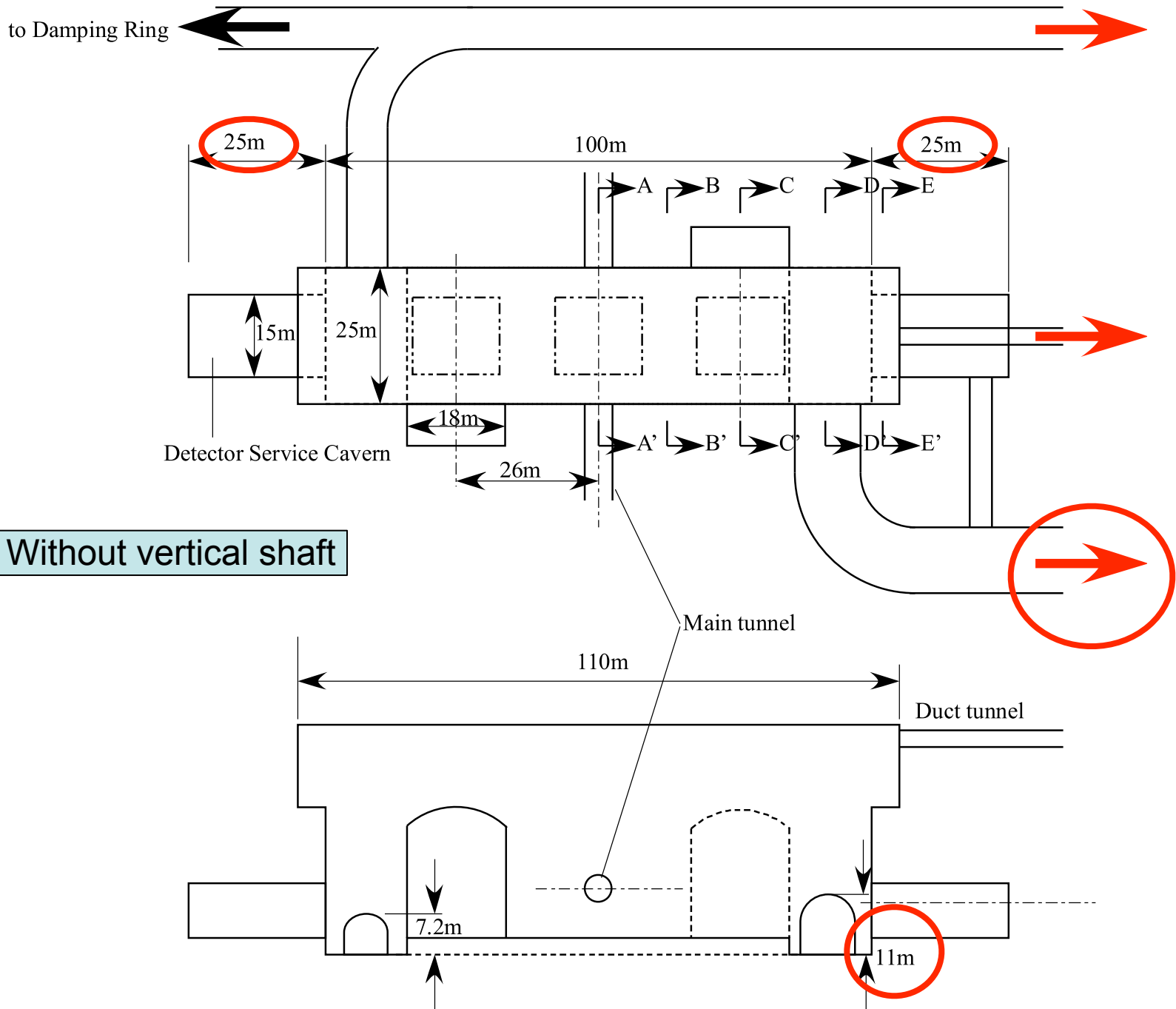
Y. Sugimoto, IWLC10, CERN/CICG, 8 Oct.2010

2011年 3月 20日 日曜日



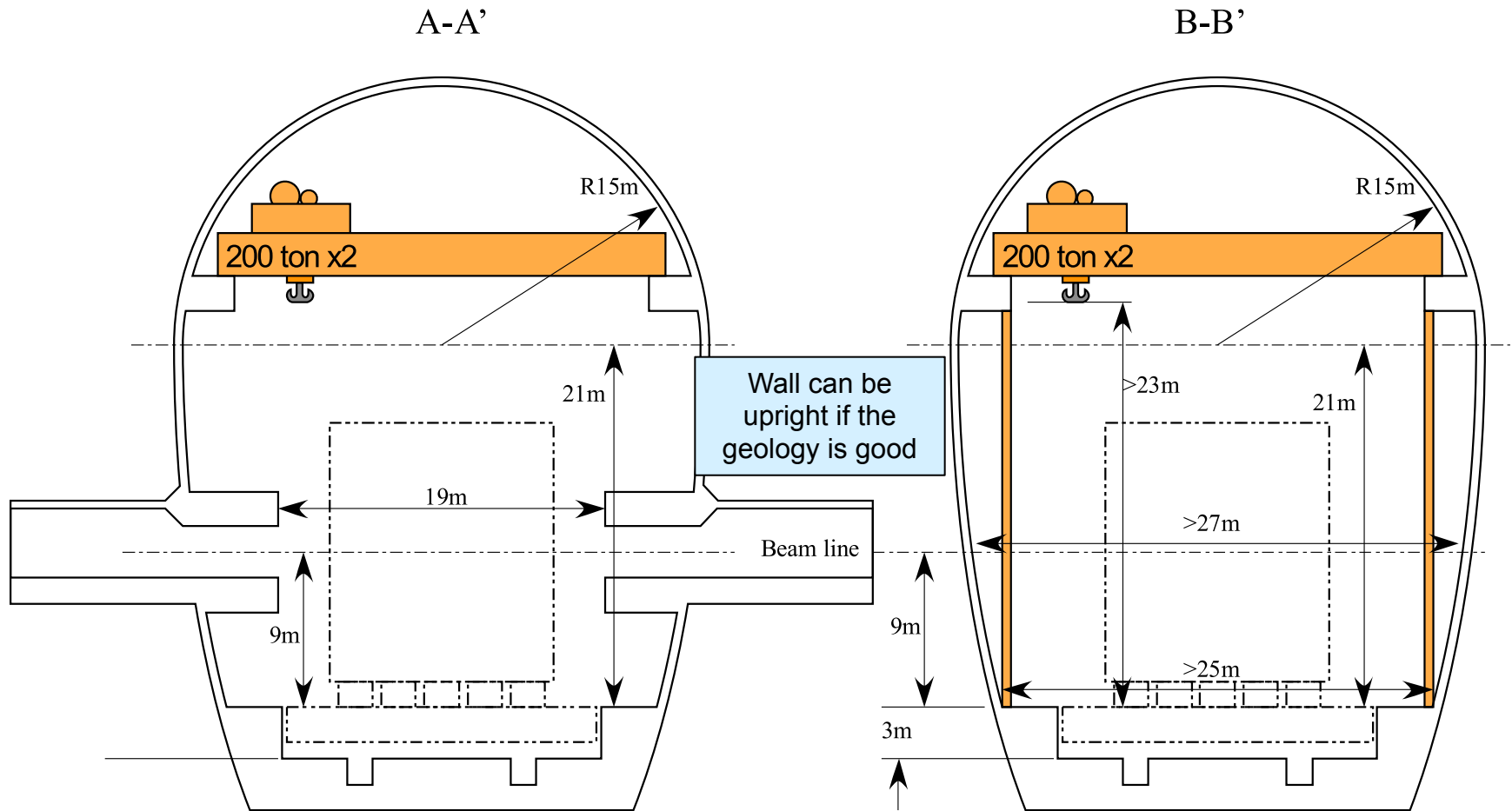
# Other issues

- Detector service caverns
  - They should be large enough to enclose detector power supplies, cooling plants for the detectors, power supplies and refrigerators for solenoids, etc.
- Beam line height
  - It would be less than 9m (decided in this WS?)
- Do we need service tunnel and survey tunnel for accelerator?
- Can we share the access tunnel for detectors with accelerator (DR, BDS)?

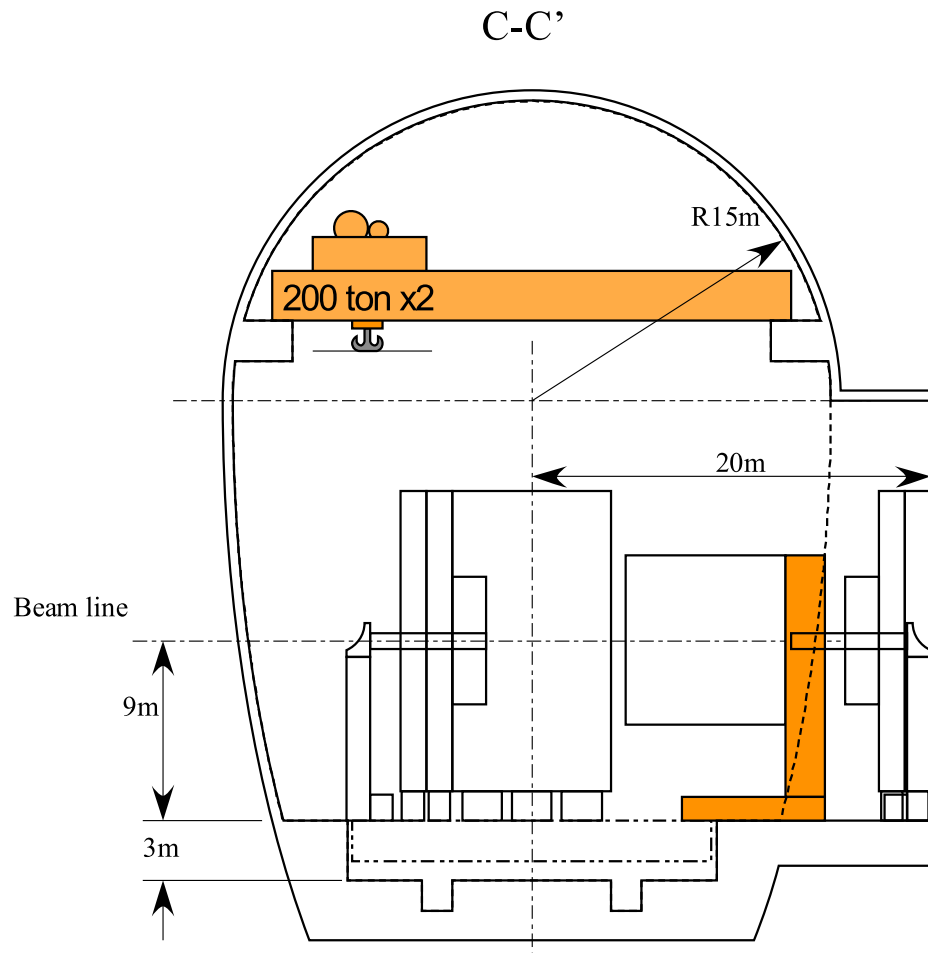


Without vertical shaft

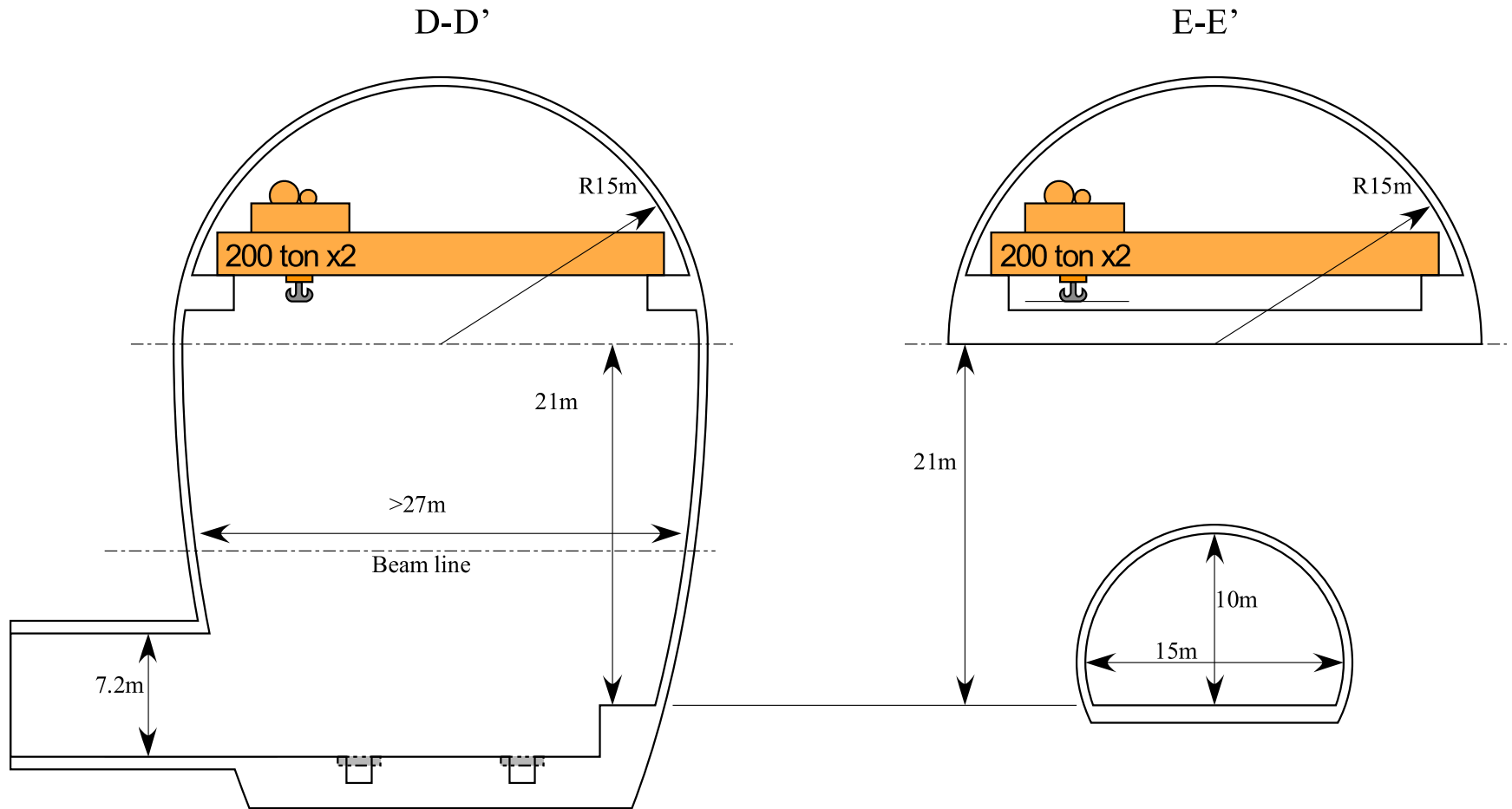
# A possible design of exp-hall

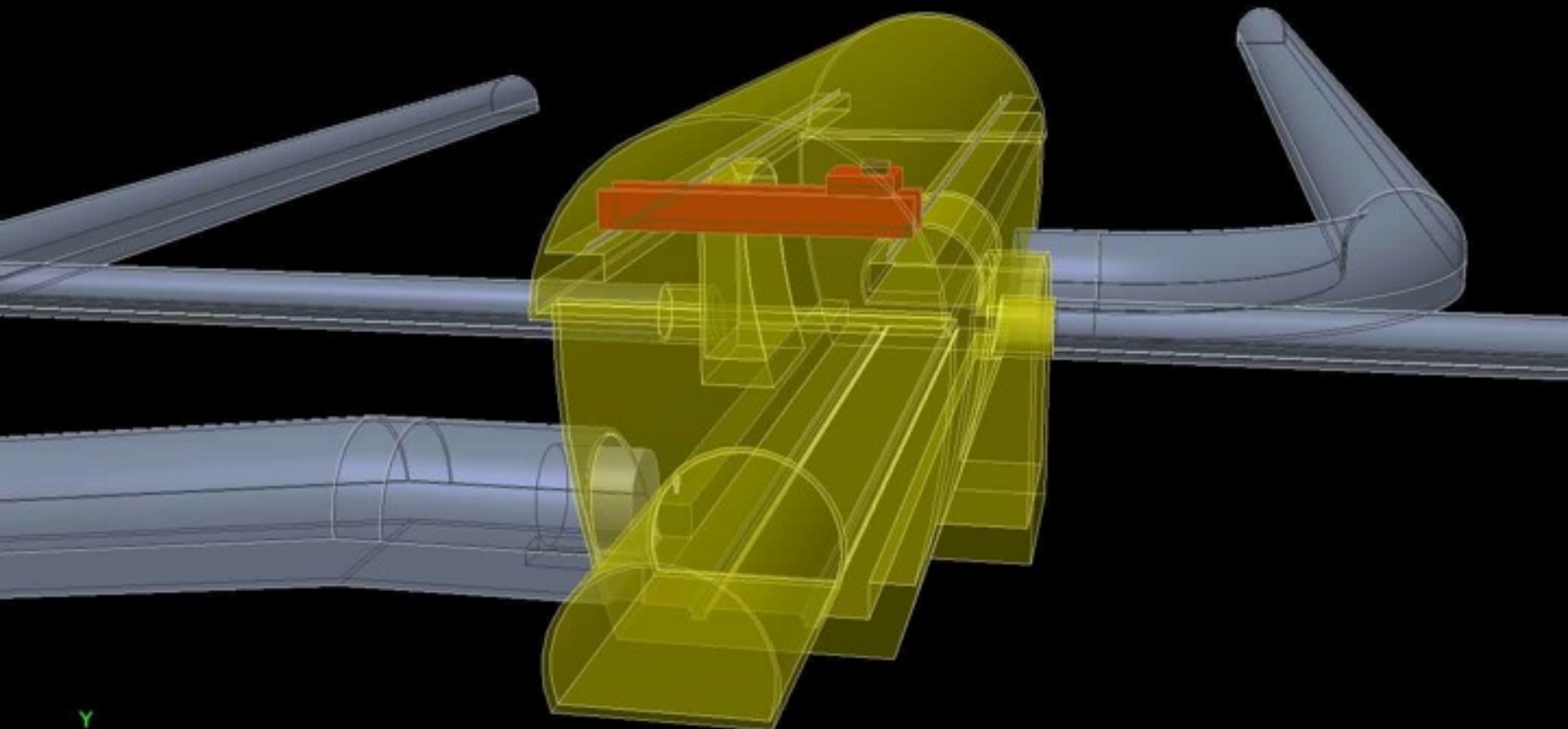


# A possible design of exp-hall



# A possible design of exp-hall





Y. Sugimoto, IWLC10, CERN/CICG, 8 Oct.2010

2011年 3月 20日 日曜日