

International Workshop on Accelerator Alignment



Contribution ID: 28

Type: **not specified**

A Floor Deformation of SACLA Building

SACLA is the Spring-8 Angstrom Compact free electron LAser, it was operated from 2011. Spring-8 is located on the very good ground, which is very stable and rigid bedrock. In contrast, the area of SACLA building, whose length is 640m, is not rigid enough. The bedrock area (cutting area) is only 1/5 of the building and 4/5 is located on the overlapping area. The maximum thickness of the embankment is over 50 m.

The SACLA building consists of a light source building and an accelerator building. The light source building, where undulator section is installed, requires to be stable especially. For this building, a direct foundation on the bedrock and an artificial layer replaced with crusher stone were adopted. The maximum thickness of that is 18 m. A civil engineering designer anticipated that its subsidence is less than 2 mm/10 years. On the other hand, for the accelerator building, pillar foundation was adopted. The maximum of the pillar length is 52 m. The designer anticipated that its subsidence is 15 mm/ 10 years.

The building was completed at March 2009. From construction phase, We have been measuring the deformation of the floor. Recent maximum subsidence is about 1 mm/year. This value is within the prediction. We will present the data of vertical and horizontal deformation of the floor and show a relationship between the deformation and the structure of SACLA building.

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