

# Status Report on the Survey and Alignment of SACLA

SPRING-8



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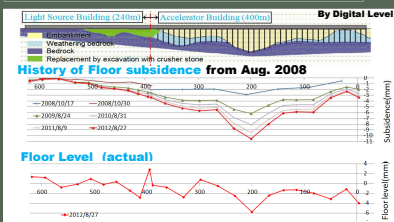


Kimura

SACLA is the Spring-8 Angstrom Compact free electron LASER, whose maximum electron energy is 8 GeV. Its final alignment was finished at January, 2011, and its first lasing was obtained at June, 2011. From the construction phase, we are still continuing measuring deformation of the SACLA building. After the commissioning, the monitoring systems (HLS, WPS) were reinforced. This report presents our activity focusing on the floor deformation of the building.



## Floor Subsidence and Floor Level



### Accelerator Building Area

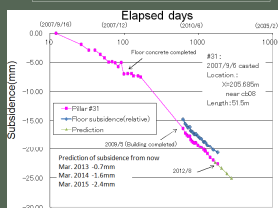
The shape of the subsidence data is very similar to that of embankment.

Recent subsidence 1.1mm/year @ Z= 200m

Light Source Building Area

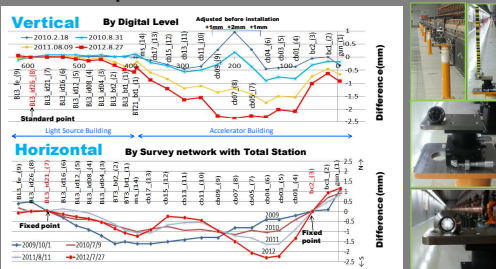
Recent subsidence 0.2mm/year @ Z= 400m

## Subsidence of top surface of concrete pillar



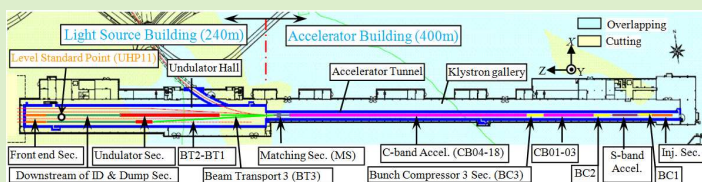
## Deformation of Reference Line

- Reference monuments were mounted as a beam line reference.
- Monuments represent actual reference line.



## Schematic view of SACLA

- Mar. 2009: Building completed
- Apr. 2009: Installation started
- Oct. 2010: Aging of accelerator started
- Feb. 2011: Beam commissioning started
- Jun. 2011: First Lasing obtained



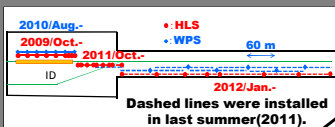
### Light Source Building

Bedrock or Replacement with crusher stone.  
Predicted Subsidence < 2mm/10years

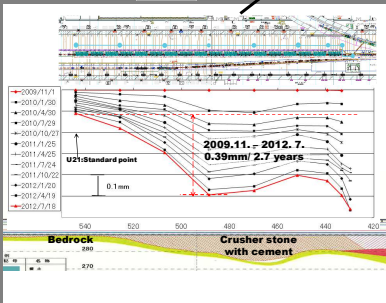
### Accelerator Building

Concrete pillar  
Total #:139  
Diameter:  
1.5 or 1.6m  
Length:19-52m  
(Ave. 30m)  
Predicted Subsidence ~20mm/10years

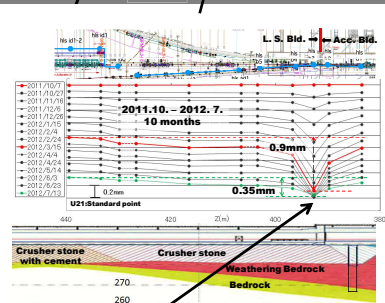
## Expansion of HLS, WPS



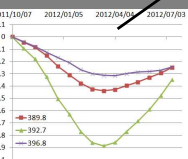
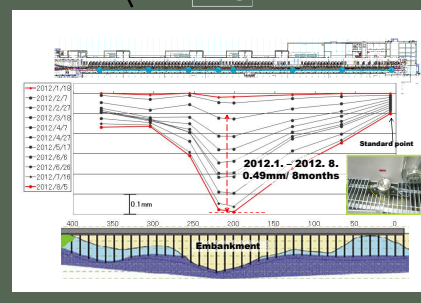
### HLS



### HLS



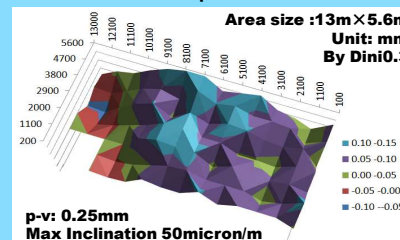
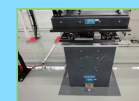
### HLS



## Epoxy Resin for Flat Floor

(Self Leveling method)

- ALPHATEC150(ALPHA KOGYO K.K.)
- Viscosity of initial mixed liquid: 600mPa·s
- Compressive Strength: 55 N/mm<sup>2</sup>
- Compressive Elastic Modulus: 1700 N/mm<sup>2</sup>
- Good floor material to improve vibration characteristic of girder.



### WPS

