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Configuration and Operation status of HLS and WPS system installed in PAL-XFEL

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All components of PAL-XFEL (Pohang Accelerator Laboratory's X-ray free-electron laser) were completely installed in December 2015, and Hard X-ray 0.1nm lasing achieved through its beam commissioning test and machine study on March 16, 2017. The beam line users are use the hard x-ray since March 22, 2017.

Several parts that comprise the large scientific equipment should be installed and operated at precise three-dimensional location coordinates X, Y, and Z through survey and alignment to ensure their optimal performance. As time goes by, however, the ground goes through uplift and subsidence, which consequently changes the coordinates of installed components and leads to alignment errors ΔX , ΔY , and ΔZ . As a result, the system parameters change, and the performance of the large scientific equipment deteriorates accordingly.

Measuring the change in locations of systems comprising the large scientific equipment in real time would make it possible to predict alignment errors, locate any region with greater changes, realign components in the region fast, and shorten the time of survey and alignment. For this purpose, HLS and WPS system are installed in PAL-XFEL.

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