

Long Term Monitoring of the LCLS-I Undulators

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Abstract

The first hard X-ray Free-Electron Laser LCLS –I is been successfully operated since April 2009. The LCLS undulator line consists of 33 segments, each tuned to location-specific K-value with high accuracy. The segments are hybrid type undulators sensitive to radiation. To detect radiation damage of the segments at early stage, a special long-term monitoring program is in place at SLAC. In addition to measuring accumulated radiation dose, each month one of the segments is taken out of the undulator line, replaced by a spare undulator, and re-measured at SLAC Magnetic Measurement Facility. The undulator parameter K and phase errors are calculated and compared with corresponding values after the initial tuning. Field integrals are also checked. In the talk we will discuss challenges we encounter doing long-term magnetic measurements and present results of the measurements.