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Work function measurement by means of photoelectron yield spectroscopy using a tunable pulsed laser to investigate short lifetime of the CeB6 thermionic cathode at SACLA

Tuesday, 9 May 2023 16:30 (2 hours)

We have been developing an in-situ work function (WF) measurement system to investigate an unexpectedly short lifetime problem of a CeB6 thermionic cathode at the SACLA electron injector. Photoelectron yield spectroscopy using a nanosecond tunable pulsed laser in the wavelength range from 410 to 709 nm was adopted because this method provides a high S/N ratio in a hot operational condition of the thermionic cathode and makes it possible to perform the measurement during the XFEL operation. As the first step, demonstrative WF measurements using an offline cathode test system have been conducted and the WF of an unused fresh CeB6 cathode was precisely estimated to be a value of 2.44±0.02 eV at a temperature of 836 ℃. In this conference, the details of the test system and the first measurement results will be presented.

Funding Agency

Footnotes

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Yes

Primary author: MAGOME, Tamotsu (Japan Synchrotron Radiation Research Institute)

Co-authors: TANAKA, Hitoshi (RIKEN SPring-8 Center); Dr TOGAWA, Kazuaki (RIKEN SPring-8 Center)

Presenter: MAGOME, Tamotsu (Japan Synchrotron Radiation Research Institute)

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