Contribution ID: **72** Type: **Oral presentation**

Newly designed radiometer for synchrotron radiation and free-electron laser in high power range

Tuesday, 27 October 2020 09:30 (20 minutes)

We designed a new radiometer to measure the absolute power of synchrotron radiation and free-electron laser in the wavelength range from the extreme-ultraviolet (EUV) to x-rays. The target measurable power range is from 1 mW to 1 W, which exceeds that of our former radiometer (a compact radiometer) of 0.01 mW to 150 mW. The new radiometer is directly mounted on a vacuum flange cooled with a fan, and can operate at room temperature or above (around 310 K). The measurement principle of the radiometer is based on a temperature measurement of an absorber, which is a component of the radiometer. The absorber is a cavity type and consists of a tungsten plate and a copper cylinder. The absorptance is higher than 99.5% for photon beams in the wavelength range from EUV to x-ray (20 eV to 60 keV); therefore, a temperature change in the absorber relates to the power of an incident photon beam. The absolute power can be evaluated from a electrical heating power applied to a heater on the absorber, namely a dynamic electrical substitution technique. We have completed the construction of the radiometer and plan to finish checking the performance of the radiometer using an electrical heating by the end of this year.

Primary author: TANAKA, Takahiro (National Institute of Advanced Industrial Science and Technology (AIST))

Presenter: TANAKA, Takahiro (National Institute of Advanced Industrial Science and Technology (AIST))

Session Classification: New Development in Photon Diagnostics and Optics 1

Track Classification: New developments in photon diagnostics and optics