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Spherical hohlraum energetics study on the SGIII prototype laser facility WENYI HUO, Institute of Applied Physics and Computational Mathematics, ZHICHAO LI, Research Center of Laser Fusion, Chinese Academy of Engineering Physics, YAOHUA CHEN, Institute of Applied Physics and Computational Mathematics, XUFEI XIE, Research Center of Laser Fusion, Chinese Academy of Engineering Physics, KE LAN, Institute of Applied Physics and Computational Mathematics — We report on the first spherical hohlraum energetics experiment performed on the SGIII prototype laser facility. In the experiment, the radiation temperature of the spherical hohlraum is measured by using an array of flat-response x-ray detectors (FXRDs) through a LEH at different angles. The radiation temperature and M-band fraction inside the hohlraum are determined by the shock wave technique. The experimental results indicate that the radiation temperatures measured by the FXRDs depend on the observation angles and are related to the view field. For the first time, we obtained the angular distribution of the radiation temperature of spherical hohlraum. We find that the accurate hohlraum conversion efficiency can not be determined by using the measured radiation temperature of a FXRD at only one specific angle. As a result, what we obtained from the experimental measurements is a range of the hohlraum conversion efficiency, but not an accurate conversion efficiency. According to the experimental results, the conversion efficiency of the vacuum spherical hohlraum is in the range from 60% to 80%. This conversion efficiency is consistent with that of the cylindrical hohlraums used on the NOVA and the SGIII-prototype at the same energy scale.

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