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Compressive asymmetry evaluation for M-Band Radiation generated from the interaction of high energy laser and the hohlraum SHAOEN JIANG, China Academy of Engineering Physics, YUNBAO HUANG, Guangdong University of Technology, LILING LI, LONGFEI JING, ZHIWEI LIN, China Academy of Engineering Physics — In indirect drive inertial confinement fusion, intense laser interacts with high-Z materials in the hohlraum and X-rays are generated to heat and drive the centrally located capsule. Most of these X-rays emitted from the wall of hohlraum are soft x-rays, but also a comparable fraction of them are high-energy X-rays (mainly from M band of wall material, >2keV for Au), which may lead to preheat and compressive asymmetry on the capsule, and affect final ignition result. Therefore, such preheat and compressive asymmetry needs to be characterized and evaluated, to enable it restrained or controlled. In this paper, by using one-dimensional multi-group radiation hydrodynamic codes and view-factor based radiation transport codes, we evaluate the compressive asymmetry on the centrally located capsule for various fractions of M-band X-rays. The result shows that: 1) The M-band X-rays may lead to significant compressive asymmetry when the thermal flux is symmetric,2) More fractions of M-band X-rays tends to result in more compressing asymmetry, and 3) 15% of M-band X-rays may result in 50% compressive asymmetry. Base on the above analysis, such significant compressive asymmetry due to M-band radiation may decrease the compressibility of the fuel or the capsule performance. Therefore, it motivates us to validate and measure such quantity of compressive asymmetry occurred on the capsule in recent experiments.

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