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Experimental campaign on spherical hohlraum in China

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In inertial confinement fusion study, the hohlraum configuration and design are essentially important for providing a radiation field with very high symmetry required by an ignition capsule, by using the laser energy and power which are available from an ignition laser facility. In 2013, we began to study the octahedral spherical hohlraums in theory, which has 6 laser entrance holes (LEHs) and octahedral symmetry, giving its configuration, design and improved configuration[1-4]. According to our theoretical study, the octahedral spherical hohlraums has a natural and robust high radiation symmetry without any supplementary technology and a high energy coupling efficiency from laser to hot spot of capsule. Based on our theoretical studies on the octahedral spherical hohlraums, we launched the experimental campaign on spherical hohlraum in 2014. Up till now, we have accomplished a series spherical hohlraum experiments on the high energy laser facilities in China, such as improvement of laser transport by using the cylindrical LEH[5], comparisons of Laser Plasma instabilities (LPI) between the spherical hohlraum and the cylindrical hohlraum[6,7], energetics of 2 LEH spherical hohlraum[8], energetics of 6 LEH spherical hohlraum[9], and so on. Our spherical hohlraum campaign has demonstrated that the octahedral spherical hohlraum has advantages in a natural and robust high symmetry, a high energy coupling efficiency, and a low LPI. Finally, we proposed to use 4ω-2ω laser as ignition driven for future ignition facility with a configuration designed for the octahedral hohlraums[10].

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