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Physical Experiments on the HEAVEN-I KrF Laser Facility

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The HEAVEN-I KrF excimer laser facility is the Chinese largest krypton fluoride laser facility, housed at the China Institute of Atomic Energy, Beijing, China. There were 6 laser beams at this facility, combined energy up to 100 J with a pulse width of 28 ns at a wavelength of 248 nm. The uniformity distribution of laser intensity is less than 2\%. The diameter of the focal spots was about 500 μm, producing a laser intensity of about 10^{12} W/cm^2.
Heaven-I's capability to provide extremely uniform focal profiles and its deep UV wavelength facilitate the conducting of experiments with laser-produced shocks with negligible effects from laser imperfections and laser plasma instability. Thus the laser facility was used in the research of high energy density physics and other related field physical experiments, such as the Shock Dynamics and the equation of state at high-pressure, simulation of space debris, and direct laser-driven quasi-isentropic compression. Side light shadow photography and imaging VISAR (Velocity Interferometer System for Any Reflector) were developed for the purpose of active diagnostic for physical experiments.

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