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10.34 A compact X-ray streak camera on Shenguang-III laser facility

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Shenguang-III (SG-III) laser facility is a new high power laser facility in China. It is built for the inertial confinement fusion (ICF) experiments with 100kJ laser driven. The X-ray streak camera is required in many experiments, such as the implosion trajectory measurement, the plasma movement with X-ray emission and the time-resolved X-ray spectrum measurement. The X-ray streak cameras with a coaxial structure deflection system had successfully operated in the middle plane of SG-III facility. Recently, a new compact X-ray streak camera has been developed and accessed the target chamber by a general-diagnostics instrument manipulator (DIM) in the north polar zone of SG-III facility. The streak tube of the new camera adopted a planar structure deflection system. The camera was assembled in a gas chamber. The length of the camera was just 1.2m. It has a spatial resolution of 25 lp/mm and a time resolution of 8 ps. The linear dynamic range was still over 200. The new camera has already been employed to measure the process of the plasma filling in the gas-filled and vacuum hohlraums. The sightline was through the laser entrance hole (LEH). The angle between the sightline and the hohlraum axis was 16 degree.

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