Multispectral x-ray imaging for imploded core temperature observation


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The coupling efficiency of short-pulse ignition laser energy to hot-spot internal energy is directly related to the feasibility of fast ignition. Experimental characterization of the hot spot has attracted much attention. Among temperature, density and neutron yield of fast ignition experiments, the temperature of the hot spot still lacks of diagnostic methods. Time-resolved multispectral x-ray imaging of hot-spot continuum emission is expected to give the time evolution of the electron temperature distribution. A dual-channel x-ray Kirkpatrick-Baez (KB) microscope with a single first spherical mirror and two secondary spherical mirrors was designed to image hot core of imploded cone-shell target at 2.5 and 3keV separately, where the first mirror is a broadband high reflector covering 2.5 and 3keV, and the secondary mirrors are multilayer narrowband high reflectors at 2.5 and 3keV, respectively. Experimental results at the SG-II laser facility are presented.

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