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### 3.1 Innovative diagnostic techniques for ICF on the ShenGuang-III laser facility in China

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Shenguang-III (SG-III) laser facility, developed by laser fusion research center (LFRC), is designed to provide the experimental capabilities to study the inertial confinement fusion (ICF) physics in China. The disintegrate experiments of inertial confinement fusion physics could be carried out at SG-III laser facility. Over 80 diagnostics have been installed at SG-III laser facility, including the optical diagnostics, the x-ray imaging diagnostics, the x-ray spectrum diagnostics, the fusion product diagnostics, the general diagnostics assistant systems, and the central control and data acquisition systems. In this presentation, we will introduce some new diagnostic techniques. These new diagnostic concepts and techniques which had been developed, included the full aperture backscattering system (FABS), near backscattering system (NBS), three dimensional velocity interferometer system for any reflector (3D-VISAR), optical Thomson scattering system (OTS), X-ray transition bandpass system (XTDS), eight channel Kirkpatrick-Baez mirror, spherical bent crystal system (SBS), spatial resolution flux diagnostic system (SRFD). The diagnostics platforms play important roles in the ICF experiments at SG-III laser facility.

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