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6.37 First result of dispersion interferometer based on CO₂ laser on EAST

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Dispersion interferometer (DI) can avoid the influence of mechanical vibration, and without the fringe jump error at the highest line-integrated electron density (1020m^{-2}) on Experimental Advanced Superconducting Tokamak (EAST). In previous bench test, the power distribution curve with nonlinear crystal angle rotation of second harmonic laser has been verified, the line-integrated density can be measured with 1017m^{-2} sensitivity and $20\ \mu\text{s}$ temporal resolution. In this paper, a dispersion interferometer based on a CO₂ laser with dual plasma passage measurements of line-integrated electron density on EAST has been built and will be tested in experiments. The DI system did not need vibration isolator, most components are installed on two floors bench which welding in a stable laser room with vibration less than $10\ \mu\text{m}$, the CO₂ laser beam vertical through the vacuum vessel and 9cm from the center of the plasma. The whole system has been built and prepare for the experiment on EAST. The development of multi-channel dispersion interferometer is discussed.

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