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12.20 A 4k Hz high temporal resolution Thomson scattering diagnostic developed on EAST

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Recently, the high frequency Thomson scattering diagnostic system has been upgraded on EAST tokamak, with a temporal resolution up to 4kHz by using a newly designed 1064nm Nd:YAG (neodymium - yttrium aluminium garnet) laser. The laser can fire 10 pulses within one burst at a frequency of 0.5Hz. Each pulse has ˜3J power, with a deviation of less than 10%. By using a single laser instead of combining several lasers, the positional accuracy was improved and the Thomson scattering system can work for a longer time with a higher frequency. Furthermore, the stray light was suppressed, and the S/N (Signal to Noise) was improved by more than 10% while the spatial resolution was increased to 3mm in minor radius. These upgraded can promote the advanced physical researches on EAST, such as ELM migration, L-H transition, etc.

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