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**Two-dimensional Thomson Scattering Measurement Using Multiple Reflection and the Time-of-Flight of Laser Light on TS-4** TAKASHI SUMIKAWA, SHINGO ITO, KOHEI YAMASHITA, EIICHIROU KAWAMORI, YASUSHI ONO, University of Tokyo, UNIVERSITY OF TOKYO TEAM — A two-dimensional Thomson scattering (2-D TS) measurement system is being constructed on TS-4 device with major/minor radii of 0.5m/0.3m and its main tasks of plasma merging and confinement of ST (Spherical Tokamak) plasma. This system is intended to measure  $T_e$  in the range of 20-200eV for  $n_e \sim 10^{20}\text{m}^{-3}$  with a spatial resolution of 160mm (four points) in the  $r$ -direction and 130 mm (three points) in the  $z$ - direction. The new ideas of our 2-D TS system are (1) to reflect YAG laser light multiple times by mirrors to cover the whole  $r$ - $z$  plane of the ST plasma, and (2) to utilize the time delay of the scattered light along the laser beam in order to reduce the necessary number of spectrometers and detectors. In a preliminary experiment, Rayleigh scattering light from two measurement points and Raman scattering light from three measurement points were successfully measured by a single spectrometer as their time evolutions, suggesting that the basic principle of the 2-D TS system functions effectively. To prepare for the TS measurement, the gas pressure dependency of Rayleigh and Raman scattering lights were observed for absolute calibration of the system. The first result of our TS system will be presented.

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