

Abstract Submitted
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Measurement of Local Burning Velocity in Turbulent Premixed Flames by Simultaneous CH-DPPLIF and Stereoscopic PIV SHOHEI TAKA, MAMORU TANAHASHI, TOSHIO MIYAUCHI, Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo, 152-8550, Japan — Simultaneous CH double-pulsed planar laser induced fluorescence (CH-DPPLIF) and stereoscopic particle image velocimetry (SPIV) measurements have been developed to investigate dynamics of flame elements in turbulent premixed flames. The CH-DPPLIF measurement, which provides displacement speed of the flame fronts directly, and SPIV measurement were conducted simultaneously in relatively high Reynolds number turbulent premixed jet flames. By selecting appropriate time interval of successive CH PLIF, movement of the flame front was captured clearly. In addition, by applying cross-correlation method for successive CH images obtained with minute time interval, displacement speed of the local flame element is measured, where the flame front is determined from mixed-average of CH fluorescence intensity in corresponding interrogation regions. Furthermore, by comparing the flame displacement speed with fluids velocity near the flame front, local burning velocity of each flame element is estimated and its relations with curvature and strain rate are discussed.

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