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### Flow Characteristics inside Liquid Phase in an Evaporating Spray by Means of PIV

by

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#### ABSTRACT

It is very significant to detect the flow characteristics inside diesel spray for understanding its mixing process between itself and its surroundings. It is capable of catching 2-D image of them only by use of PIV method not LDV technique. One of authors presented the characteristics of a non-evaporating spray of JIS-second class gas oil under the elevated pressure by applying this method in the other paper. This paper describes the case of an evaporating diesel spray under the quiescent atmosphere with high temperature at high pressure. 2-D image of Mie scattering of the unsteady spray was taken by a thin sheet of laser light passing through the cross sectional area including the spray axis. The distribution of velocity and that of vorticity were calculated by the application of the cross-correlation method as PIV technique to 2-D images. Figure 1 shows one of examples of the velocity distribution. Comparing with such results of evaporating spray and those of non-evaporating spray, the flow characteristics inside the former one are almost the same as those inside the latter one.

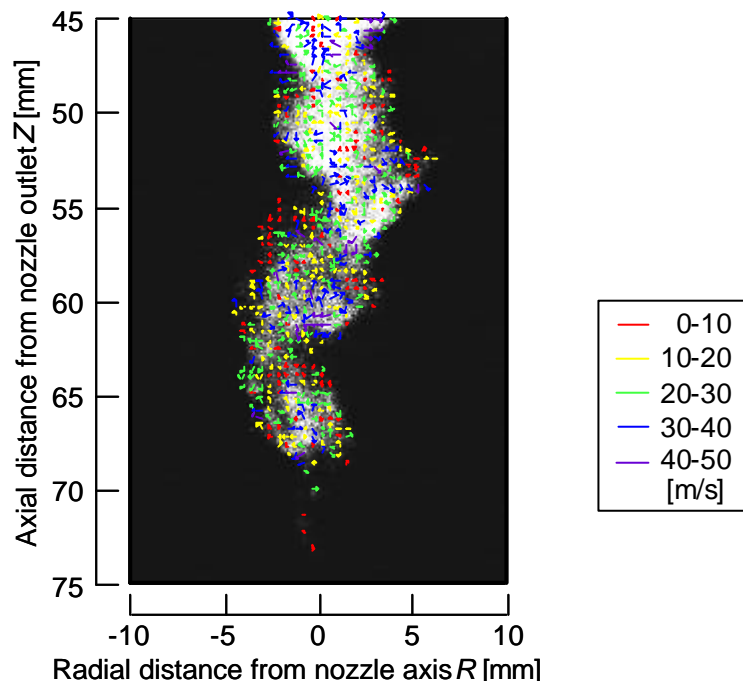


Fig. 1 One of examples of velocity distribution inside evaporating diesel spray ( $t=1.12$  [ms],  $t_{inj}=1.54$  [ms])