

Figure 1. Schematic drawings of the central jet

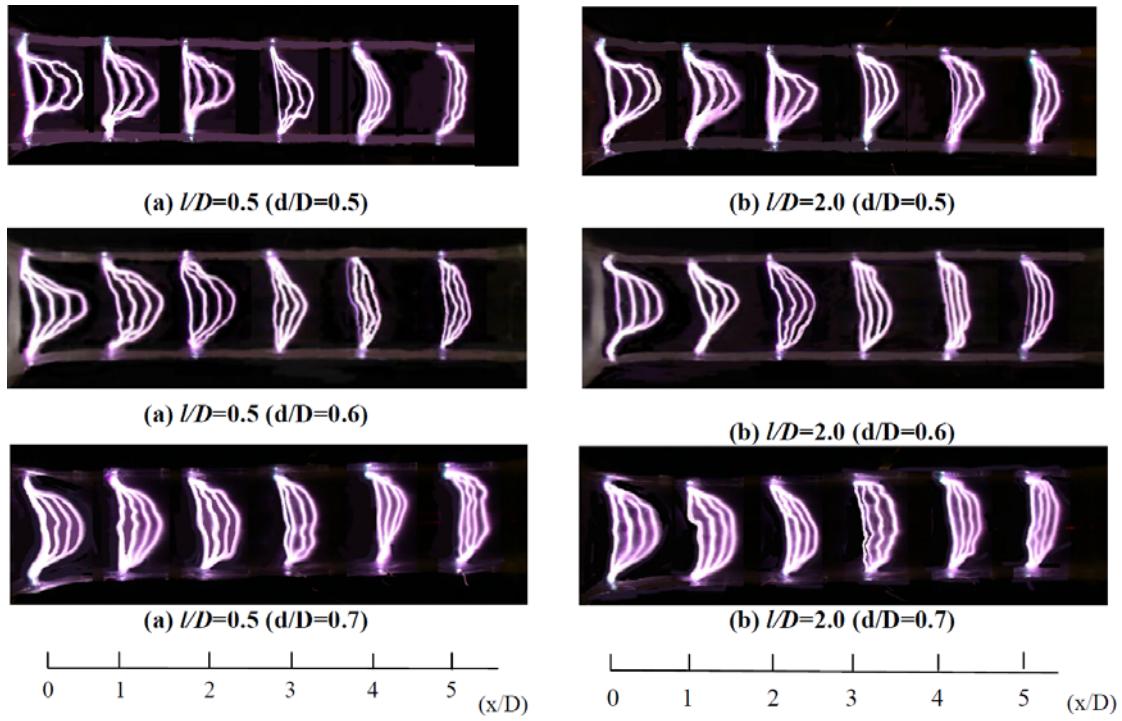


Figure 2. Visualization of velocity distribution in mixing throat by the spark tracing method ( $M = 0.1$ )

## STUDY ON THE OPTIMUM MIXING THROAT LENGTH OF THE CENTRAL JET PUMP

C. PRABKEAW<sup>1</sup>, K. OGOSE<sup>2</sup> and K. AOKI<sup>2</sup>

<sup>1</sup>Department of Mechanical Engineering, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand

<sup>2</sup>Department of Mechanical Engineering, Tokai University, Kanagawa, Japan

In this study, the flow pattern and pressure distribution in the pump for the change of position of the drive nozzle's diameter ( $d/D$ ) and position ( $l/D$ ) is investigated. Figure 1 shows schematic drawings of the central jet pump used in this study. Figure 2 was obtained by using the spark tracing method in the mixing throat when the drive nozzle's position ( $l/D$ ) is 0.5 and 2.0 at  $d/D = 0.5, 0.6, 0.7$ , and the flow rate ratio  $M = 0.1$ . The change of velocity distribution in the mixing throat can be seen from this visualization result. When  $l/D$  is small, the flow in the circumference part shows the backflow though flow velocity at the throat entrance is constant. And the recalculating region near the wall in the mixing throat is moved to downstream and the flow velocity becomes a uniform flow. Here, the length in which flow in mixing throat reached the uniform flow velocity has been defined as mixing length. Therefore, mixing length  $Lm/D$  is about 3.5 for  $l/D=0.5$ . Moreover,  $Lm/D$  is about 1.5 for  $l/D=2.0$ . When  $l/D$  increases, it can be confirmed to show the tendency where the mixing length moves to the downstream. Moreover, the position that becomes a uniform flow when  $d/D$  increases is found moving to the downstream side.