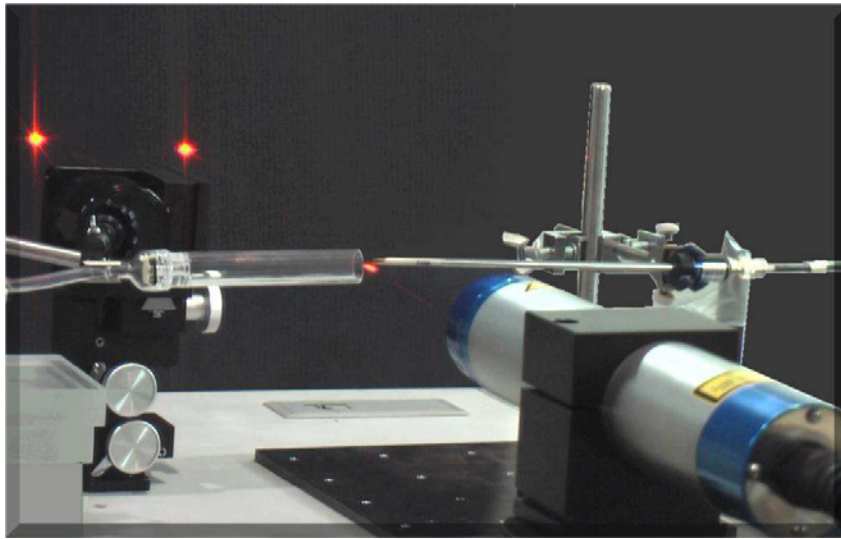


# *Fluid Dynamics Solutions*

## Application Note

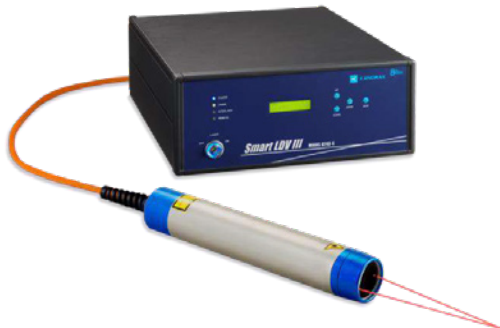
### < Flow Measurement of a Vocal Fold Model >

Flow velocity of a flute-type artificial vocal fold model has been measured with the Laser Doppler Velocimeter ([Smart LDV](#)) and Hot-Wire Anemometer ([Smart CTA](#)). By measuring with two different methods of the principle simultaneously, we have verified the validity and reliability of measured data.



Probe Setup at Measurement Points

Smart LDV III



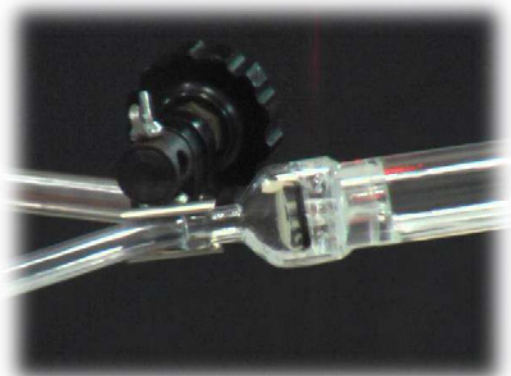
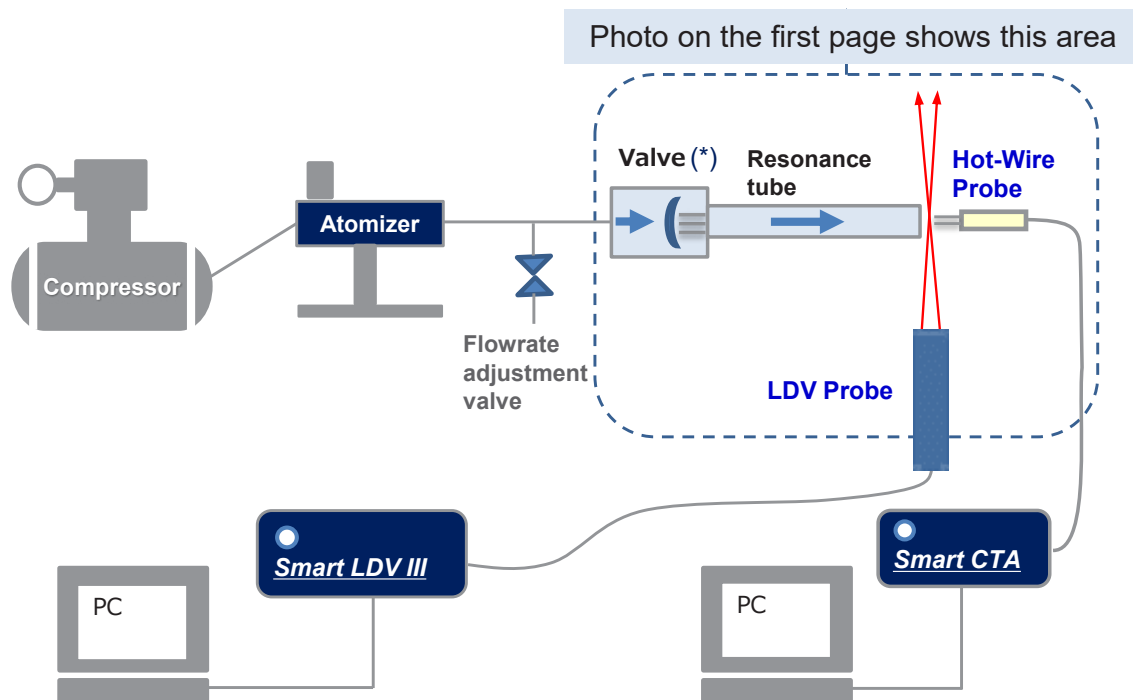
Smart CTA



## < Measurement Setup >

The experimental model consists of a valve at the inlet of compressed air and a resonance tube attached in the wake of the valve.

The air passing through the flexible valve opening is flown out through the resonance tube. Upon varying air flowrate supplied from the upstream, a sound is generated which is determined by the length of the resonance tube in relation to a certain amount of air volume.



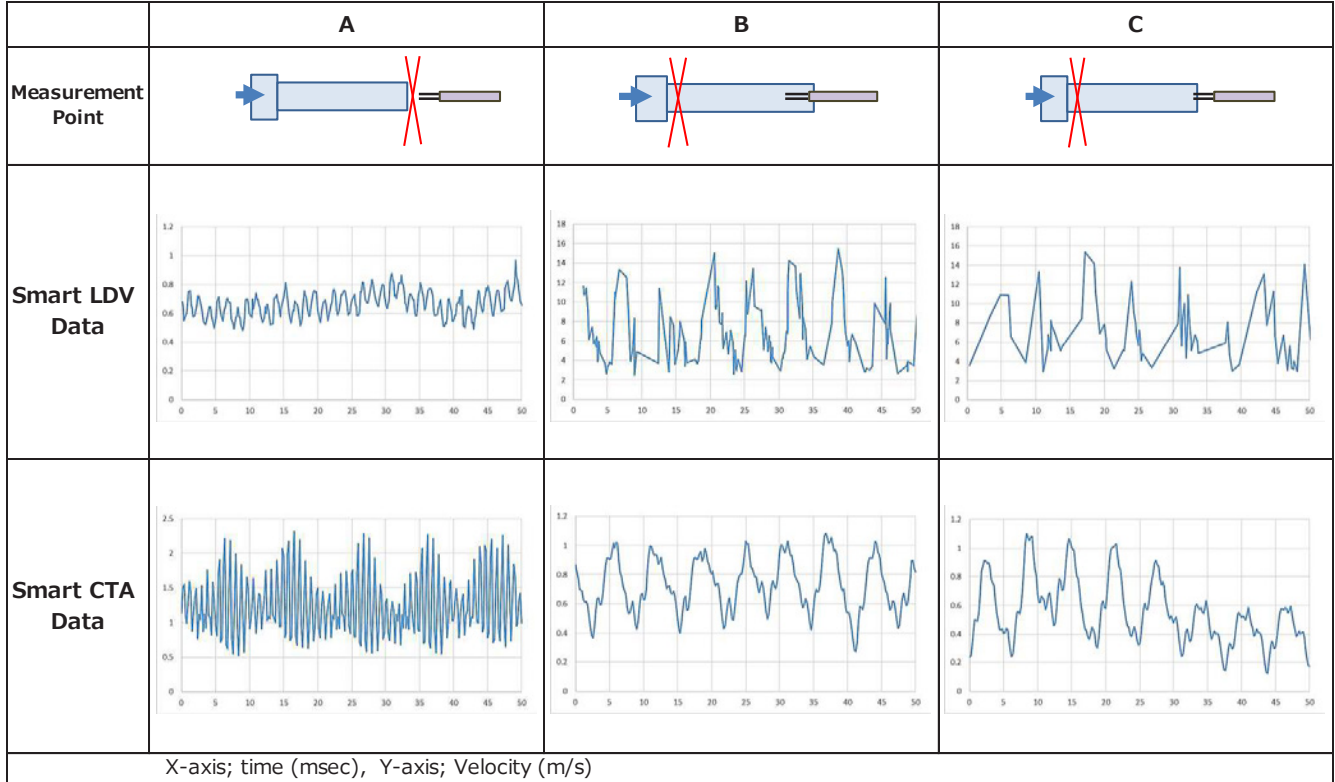
(\*) Inlet valve part enlarged





## < Measurement Result >

Here shows measurements with three different places.



### Summary:

A	Velocity at resonance tube outlet  The measurement volume of Smart LDV is distanced at approx. 1 cm from the resonance tube outlet and placed at the middle. The measurement point of Smart CTA is also distanced at approx. 1 cm from the outlet and placed above the measurement volume of Smart LDV.	approx. 0.5~1 m/s (by Smart LDV) approx. 0.5~2 m/s (by Smart CTA)
B, C	Velocity behind the inlet valve Velocity at resonance tube outlet  The velocity fluctuation cycle is approx. 160 Hz, which is observed by both measurements with Smart LDV and Smart CTA.	approx. 5~15 m/s (by Smart LDV) approx. 0.2~1 m/s (by Smart CTA)

Courtesy: Associate Prof. ISHIKAWA Satoshi, Dynamics of Mechanical Systems, Dept. of Mechanical Engineering, Faculty of Engineering, Kyushu University

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