Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

**Visualization of the flow and its vibration in Japanese traditional bamboo flute** SATOSHI SOMEYA, KOJI OKAMOTO, MASAO IIDA, Univ. of Tokyo — Any wind instrument can sound due to the vibration of the air, expiration flow inside of the wind instrument. In case of a trumpet or a clarinet, a mouth or a reed helps to sound variable tones. In case of a flute, there is no mechanical vibration. The basic mechanism of the sound, i.e., the vibration, is well-known. A hot wire type flowmeter may be applied to measure the vibration and its frequency, but it can measure only at a certain point. We would like to investigate more detail about the flow and the vibration with sound inside and outside of the flute, in order to understand the mechanism of the wind instrument and to aid in the manufacture of the good instrument. In this report, a Japanese traditional bamboo flute was used in the experiment. We tried to measure the vibration multi-dimensionally by the Dynamic PIV. 2 kinds of experiments were done. At first, we measured the Argon-gas flow with different tone inside/outside of the bamboo flute at 5000Hz using a high frequency pulse laser. Oil mist was used as the tracer particles. Then, we also tried to measure the flow of bamboo flute when a human player played, using a CW-laser and the water-mist as the tracers. As a result, we successfully measured the oscillating flow. The flow near a hole of the bamboo flute went out from and came into the flute at about 500Hz dependent on the tone. The flow outside of the labium of flute was also measured.

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Date submitted: 01 Aug 2006 Electronic form version 1.4