

## Analysis of Low-Profile Piezoelectric Butterfly Linear Motor using 3D Laser Vibrometer

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**Abstract :** Piezoelectric linear motors have been widely studied for auto focusing devices of digital cameras and cellular phones due to their simple structure. In this paper, we confirmed that novel piezoelectric butterfly linear motor was fabricated and its dynamic properties were analyzed. The piezoelectric transducer (having size  $9 \times 8 \times 1 \text{ mm}^3$ ) is composed of an elastic plate, which includes a tip for energy transfer and two fixing protrusions for fixture, and two piezoelectric ceramics. The butterfly linear motor has been designed and optimized using ATILA simulation program. The superposed motion is an elliptical vibration on the tip. The actual movement of the manufactured actuator was confirmed by a 3D laser dopler vibrometer and compared with the simulation results. The results of numerical study and experimental investigation will be used for the future optimization of the actuator and the realization of the advanced ultrasonic motor.

**Key Words :** Piezoelectric, Linear motor

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