Study on a Fast Tool Servo (FTS) Driven by Piezoelectric Ceramic

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It is designed a Fast Tool Servo (FTS) device which based on piezoelectric ceramic and jointed by flexible hinge. The flexible hinge has been analyzed and optimized both by the theoretical calculation and finite element analysis; and it has been physically manufactured and tested by means of pressure sensor and laser interferometer. The stiffness model was established. The driving voltage and displacement relationship has been revealed. The results indicate that this FTS system can reach a travel range for 60μm; And the frequency response precedes 150Hz within 39μm travel range.