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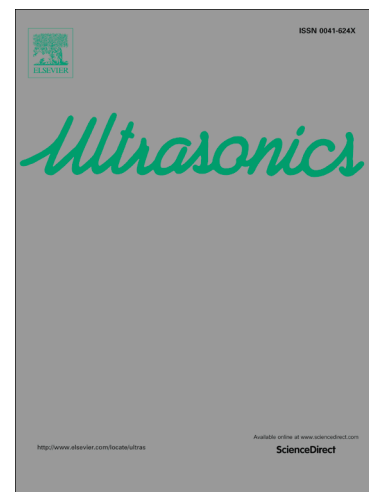
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Piezoelectric parametric effects on wave vibration and contact mechanics of traveling wave ultrasonic motor

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Abstract

Elastic wave quality determines the operating performance of traveling wave ultrasonic motor (TWUM). The time-variant circumferential force from the shrink of piezoelectric ceramic is one of the factors that distort the elastic wave. The distortion deviates from the ideal standard sinusoidal waveform and affects the contact mechanics and driving performance. An analytical dynamic model of ring ultrasonic motor is developed. Based on this model, the piezoelectric parametric effects on the wave distortion and contact mechanics are examined. Multi-scale method is employed to obtain unstable regions

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