

电机与电器

一种矩形振子新型压电直线电机

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摘要: 分析了振子面内弯曲模式的激发原理及电机的驱动机理。通过Ansys分析计算, 得到了压电振子面内两种弯曲模式的频率, 并对压电振子及电机结构进行了设计。研制了一种基于矩形复合层板面内弯曲模式压电直线电机, 并进行了相应的实验研究。研究表明: 当激励信号电压为380 V, 频率为65.2 kHz时, 电机最大运行速度约为458.3 mm/s, 驱动力为2.2 N, 且正反向运行良好。

关键词: 矩形振子 压电 直线电机

A New Type of Linear Piezoelectric Motor Based on Rectangular Actuator

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Abstract: A self-moving linear piezoelectric motor based on two different in-plane bending modes of rectangular actuator has been developed. Firstly, the excitation of working vibration modes and motion mechanism of this kind of motor have been analyzed and discussed. Then, in-plane vibration frequencies of actuator are calculated, new motor and its actuator has been designed, and a motor sample for the new type of linear ultrasonic motor is fabricated, and its performance is evaluated experimentally. The experimental results show that new motor offers identical performance in both directions, the maximum velocity is 458.3 mm/s and the maximum drive force is 2.2 N while excitation frequency is 65.2 kHz and voltage is 380 V.

Keywords: rectangular actuator piezoelectric linear motor

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