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Positioning Behavior Resulting from the Application of Ultrasonic Oscillation to a Linear Motion Ball Bearing during Step Motion

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Highlights:

Appropriate oscillation pattern for step motion is proposed.
Average displacement of positioning is improved from 1.0097 mm to 1.0030 mm.
Delay time of movement is improved from 14.975 ms to 14.65ms.
Ultrasonic oscillation reduces the frictional force of a linear motion ball bearing.
Ultrasonic oscillation is able to improve the positioning performance.

ABSTRACT:

In general, positioning accuracy of precision machineries equipped with a moving table is strongly influenced by friction encountered by linear motion rolling bearings. However, ultrasonic oscillation is