

The Simulation of Motion of a Slider Upon a Stator Due to Frictional Force Using COMSOL Multiphysics® Software

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Abstract

The Surface Acoustic Wave (SAW) linear motor was studied which is developed utilizing the friction principle for driving. The principle says that, when a slider is placed on the Rayleigh waves generated on a stator, the slider moves in reverse direction of the wave due to friction between the stator and the slider. A LiNbO₃ piezoelectric substrate is used as a stator where comb structured Al electrodes were fabricated. In this study, firstly, we have optimized the required pre-load to be applied to the slider for the movement. And secondly, the coefficient of friction to drive the slider on the friction surface of the stator. A burst of signals is applied to the motor arrangement to start it in motion and study the characteristics. The frequency applied for the motion is 8.82 MHz which is optimized and generated from the different RF power ranges.

Figures used in the abstract

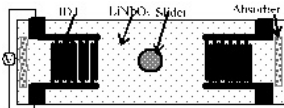


Figure 1

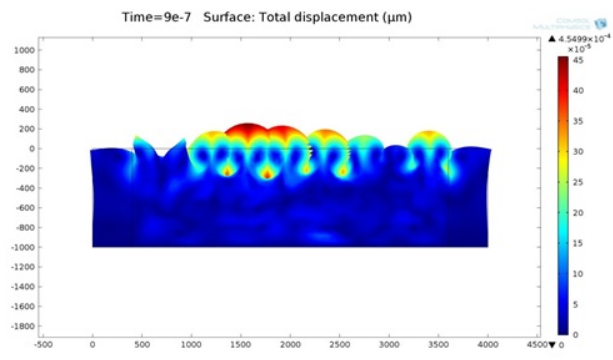


Figure 2