The analysis on effect of thrust constant, spring constant, electrical time constant, mechanical time constant to oscillation displacement of slot-less linear oscillatory actuator

ABSTRACT

This paper presents the analysis on effect thrust constant $k_f$, spring constant $k_s$, electrical time constant $T_e$ and mechanical time constant $T_m$ to oscillation displacement of slot-less linear oscillatory actuator (LOA) using Permeance Analysis Method (PAM). The results show that the LOA geometrical structure has high impact on the thrust constant $k_f$, spring constant $k_s$, electrical time constant $T_e$, mechanical time constant $T_m$ and as a result affect the oscillation displacement $x$. Finally, the analysis presents in this paper can be used to determine the best LOA structure based on the desired thrust constant $k_f$, spring constant $k_s$, electrical and mechanical time constant $T_e$ and $T_m$, and oscillation displacement.

Keyword: Linear oscillatory actuator; Thrust constant; Electrical time constant; Mechanical time constant; Spring constant; Oscillation displacement