

## Thrust Optimization of Linear Oscillatory Actuator Using Permeance Analysis Method.

### ABSTRACT

This paper describes thrust optimization of linear oscillatory actuator (LOA). The objective of the optimization is to obtain the highest as possible thrust at restricted weight of LOA in order to ensure it equipped with adequate thrust and mobility features. In this research, the LOA is aim to have a starter thrust higher than 200 N while having total of weight lower than 2.0 kg. The thrust of LOA was optimized by using permeance analysis method (PAM). The thickness of the permanent magnets and the height of coils have been varied at different fixed total of radius of LOA in order to obtain the optimized structure. The optimized structure of LOA was decided by using two different methods. The first method is by evaluating the each point of the calculation output. The second method is by using generic algorithm. Both output of these method giving a different result in term of LOA PM's thickness however having similar thrust characteristics. The FEM and measurement results were used to verify the PAM output. Consequently, the LOA has been designed with optimum parameters which having value of starter thrust of 245 N and the total weight is 2.0 kg.

**Keyword:** Linear Oscillatory Actuator; Thrust Optimization; Permeance Analysis Method; Generic Algorithm