



Contribution ID: 1096

Type: Poster Presentation of 1h45m

## Characteristic Analysis for the Influence of Auxiliary Teeth and Notching on the Reduction of the Detent Force of a Permanent Magnet Linear Synchronous Generator

*Wednesday, 30 August 2017 13:15 (1h 45m)*

This study considered the reduction of the detent force of a permanent magnet linear synchronous generator (PMLSG). In general, the PMLSG has a relatively large magnetic air gap. Consequently, in the design of the PMLSG, its structure can be composed of single-sided and double-sided structures. The double-sided structure can produce larger force. The PMLSG also has a slotted-type stator structure, which reduces magnetic energy loss. However, the slotted PMLSG has a detent force caused by the interaction between the permanent magnet (PM) mover and the slotted stator core. This is generally an undesirable effect that contributes to the thrust force ripple, vibration, and noise of the PMLSG. Therefore, in PMLSG design, a method to minimize the detent force is necessary. Various techniques to reduce the detent force of the PMLSG have been reported. In particular, the influence of auxiliary teeth and notching on the detent force has been analyzed and experimentally verified. The detent force should be minimized because it can be a major cause of linear machine vibration. A method for the optimal design of the tooth-slot structure and PM was studied in this paper. The full manuscript will discuss the analysis procedure for detent force minimization under the no-load condition.

### Submitters Country

Republic of Korea

**Primary authors:** SEO, Sung-Won (Chungnam National University); Prof. CHOI, Jang-Young

**Co-authors:** Dr KOO, Min-Mo; Mr JANG, Gang-Hyeon (Chungnam National University)

**Presenter:** SEO, Sung-Won (Chungnam National University)

**Session Classification:** Wed-Af-Po3.06

**Track Classification:** E2 - Generators