Contribution ID: **879** Contribution code: **TUE-PO1-509-04** Type: **Poster**

Basic Study on Stable Levitation for Magnetically Levitated Mover (MAGLEM) Using High Tc SC Coils

Tuesday, 16 November 2021 13:15 (20 minutes)

INTRODUCTION

Recently, magnetic levitation techniques have been developed for various fields such as magnetically levitated vehicles and energy storage flywheels. Thus, there are many reports about levitation techniques using high critical temperature (Tc) superconducting magnetic bearings (SMBs) composed of superconducting (SC) bulk and permanent magnet (PM). However, there are not so many reports about levitation techniques using SC coils and PMs. In this paper, a new magnetically levitated mover (MAGLEM) using SC coils running on PM guideway is discussed.

STRUCTURE OF MAGLEM

Our group has made a MAGLEM composed of an aluminum body with four SC coils. The MAGLEM runs on the guideway composed of PMs. The MAGLEM measures 0.57 kg in weight, 223 mm in length, 168 mm in width and 67 mm in height. The MAGLEM is composed of four SC coils with 25 mm in inner diameter, 49 mm in outer diameter and 20 turns. The guideway is composed of two railways with an arrangement of alternating polarity PMs. In order to get the speed of the MAGLEM, it is forced to push after the SC coils cooled down.

EXPERIMENTS AND DISCUSSIONS

In the experiments, various speeds are performed. This paper discusses the levitation force, the dynamic characteristics during the running, etc. Each speed gradually decreases with increasing time. This is because there are energy losses in the SC coils. It is found that the levitation force is periodical depending on the speed.

SUMMARY

A new MGLEM is proposed. The mover is composed of four SC coils. The guideway is composed of two railways with an arrangement of alternating polarity PMs. Several experiments are performed to verify the levitation principle.

Primary author: Prof. KOMORI, Mochimitsu (Kyushu Institute of Technology)

Co-authors: Prof. ASAMI, Ken-ichi (Kyushu Institute of Technology); Prof. SAKAI, Nobuo (Kyushu Institute of Technology); Mr YAMASE, Ryota (Kyushu Institute of Technology)

Presenter: Prof. KOMORI, Mochimitsu (Kyushu Institute of Technology)

Session Classification: TUE-PO1-509 Maglev and Levitation I