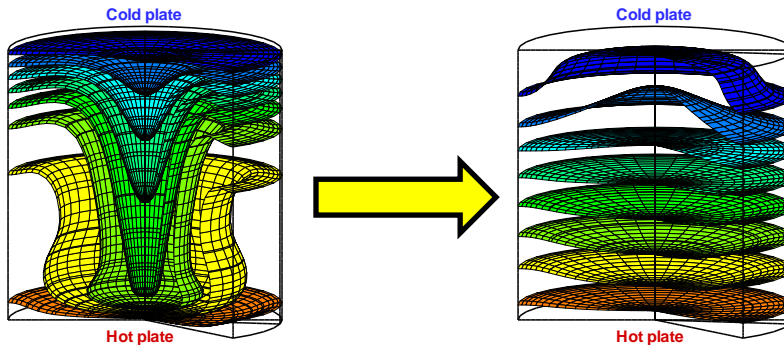


Heat transfer control of non-ferrous fluid by magnetic force

Associate Professor Masato Akamatsu

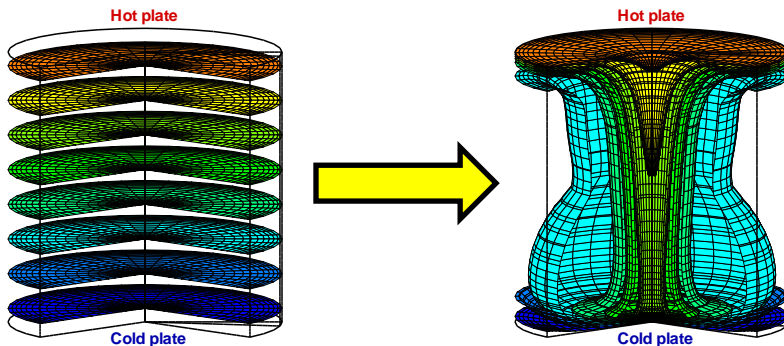
Effect of magnetic force on natural convection of air



Non-magnetic force

Magnetic force

Effect of magnetic force on density stratification of air



Non-magnetic force

Magnetic force

Content : The magnetic force is a body force as well as a gravitational buoyant force and is generated only under an inhomogeneous magnetic field. Although this force acts on all substances, the magnetic force acting on a non-ferrous fluid can usually be disregarded. However, it is not possible to disregard the effect of a magnetic force under the steep magnetic gradient generated by a super-conducting magnet. Recently, a superconducting magnet that does not require liquid helium has been developed. At present, it is possible for this superconducting magnet to generate a strong magnetic field of 10 T or more. Therefore, research into the effect of magnetic force on all kinds of substances are being carried out in various fields. The generation of a magnetic force inside the bore space of a super-conducting magnet has produced many interesting phenomena. In order to clarify the fluid flow and heat transfer characteristics of the magnetothermal convection of non-ferrous fluid created by a magnetic force inside the bore space of the super-conducting magnet and to consider its possible engineering applications, we carry out the research by means of both the numerical simulation and experiment.

Yamagata University Graduate School of Science and Engineering
Research Interest : Heat Transfer,
Numerical simulation

E-mail : akamatsu@yz.yamagata-u.ac.jp
Tel : +81-238-26-3283
Fax : +81-238-26-3283
HP : <http://mipultra.yz.yamagata-u.ac.jp/>

