

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Analysis of Interrelationship between Stability and End Effect in the Magnetohydrodynamic Flow of Annular Linear Induction Electromagnetic Pump JAESIK KWAK, HEE REYOUNG KIM, Ulsan National Institute of Science and Technology — One of the most important parts in the development of generation IV nuclear reactors is safety. In the research on generation IV sodium-cooled fast reactors, Annular Linear Induction electromagnetic Pump (ALIP) have received attention for the stable transport of coolants. In this study, the stability of an ALIP was evaluated using a mathematical approach to obtain the critical value of the developed pressure. The critical developed pressure equation is a function of the flow rate and dimensionless parameters, which were derived from the theoretical model of the ALIP with a dimensionless scaled velocity, flow rate, and pressure. Also, influence of end effect which is caused by distortion of magnetic field on stability in the magnetohydrodynamic flow is analyzed. The influence is estimated expressed using the critical value of the developed pressure and dimensionless parameters.

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Date submitted: 27 Jun 2019

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