

International Conference on Fast Reactors and Related Fuel Cycles: Next Generation Nuclear Systems for Sustainable Development (FR17)



Contribution ID: 604

Type: POSTER

Characterization of LBE Non-isothermal Natural Circulation by Experiments with HELIOS Test Loop and Numerical Analyses

Wednesday, June 28, 2017 5:50 PM (1h 10m)

We present results of experiments with lead-bismuth eutectic (LBE) non-isothermal natural circulation in a full-height scale test loop, HELIOS, and numerical modeling results performed by a system thermal-hydraulics code. The experimental studies were conducted under steady state as a function of core power conditions from 9.8kW to 33.6kW. Local surface heaters on the main loop were activated and finely tuned by trial-and-error approach to make adiabatic wall boundary conditions. Activities on numerical modeling were carried out by a thermal-hydraulic system code MARS-LBE using the well-defined experimental data. It is found that the predictions were mostly in good agreement with the experimental data in terms of mass flow rate within 7% and temperature difference within 7%, respectively.

Country/Int. Organization

Republic of Korea, Seoul National University

Primary author: Mr SHIN, Yonghoon (Seoul National University)

Co-authors: Dr JU, H (Department of Energy Systems Engineering, Seoul National University); Prof. HWANG, IL SOON (Seoul National University); Dr CHO, J (Korea Atomic Energy Research Institute); Dr LEE, J (Department of Energy Systems Engineering, Seoul National University); Dr SOHN, S (Department of Energy Systems Engineering, Seoul National University)

Presenter: Mr SHIN, Yonghoon (Seoul National University)

Session Classification: Poster Session 2

Track Classification: Track 6. Test Reactors, Experiments and Modeling and Simulations