

Quarterly Progress Report

(Aug. 01 – Oct. 31, 2003)

Developing A Sensing System for the Measurement of Oxygen Concentration in Liquid Pb-Bi Eutectic

Principle Investigators:

Dr. Yingtao Jiang
Department of Electrical and Computer Engineering
UNLV
yingtao@egr.unlv.edu

Dr. Bingmei Fu
Department of Mechanical Engineering
UNLV
bmfu@nscee.edu

Dr. Woosoon Yim
Department of Mechanical Engineering
UNLV
wy@me.unlv.edu

Developing A Sensing System for the Measurement of Oxygen Concentration in Liquid Pb-Bi Eutectic

Introduction

The experimental setup designed and manufactured in UNLV was shipped to LANL in early Aug. One student has been working in LANL to conduct the experiment since then. In the meantime, one new Ph. D. student has started to run the simulation for transport in oxygen mixing. In Oct., a professional has been hired to work in both experimental and the theoretical studies pertaining to the proposed work.

Personnel

Principal Investigators:

Dr. Yingtao Jiang (Electrical and Computer Engineering)

Dr. Bingmei Fu (Mechanical Engineering)

Dr. Woosoon Yim (Mechanical Engineering)

Professional

Dr. Jian Ma, Professional, (Mechanical Engineering) started on Oct. 1, 2003

Students:

Mr. Ramkumar Bhavani Sivaraman (Electrical and Computer Engineering)

Mr. Shahidur Rahman (Ph. D. student in Mechanical Engineering)

Management Progress

Expenditures incurred during this quarter are within the target amount allocated.

Management Problems

One student was overpaid for the summer 2003. That problem has been identified and consequently corrected.

One student has been waiting for his visa to come back to the campus.

Technical Progress

The final version of the paper regarding the new experimental setup is submitted to AccApp'03 to be included in the proceeding.

We have finally assembled both experimental setups in LANL, one system is from UNLV and the other is from LANL.

Some preliminary results regarding the simulations for the transport phenomena in the new apparatus have been obtained.

Technical Difficulties

Except for a few short period of time, the experimental setup from UNLV did not generate positive responses. We are still trying to figure out the reasons. The experimental setup from LANL experienced a few serious problems. For instance, the crucible is broken on its early operational hours. The reason is still to be determined. One possibility is due to the thermal stress on the crucible, which comes from the improper LBE input.

Plans for the Next Quarter

- Locate the problems for both experimental setups.
- Once the problems are fixed, we shall continue to perform the experimental work on both setups.
- Simulation shall be performed using FLUENT under UNIX-based Sun workstation.