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## Developing A Sensing System for the Measurement of Oxygen Concentration in Liquid Pb-Bi Eutectic: Quarterly Progress Report (Nov. 01 – Jan. 31, 2002)

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# **Quarterly Progress Report**

**(Nov. 01 – Jan. 31, 2002)**

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

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

## Introduction

The design of the new apparatus for oxygen measurement/calibration has been completed. This new apparatus shall be of great importance for the UNLV researchers to conduct the research work in the campus.

## Personnel

Principal Investigators:

- Dr. Yingtao Jiang (Electrical and Computer Engineering)
- Dr. Bingmei Fu and Dr. Woosoon Yim (Mechanical Engineering)

Students:

- Mr. Xiaolong Wu, Graduate Student, (Electrical and Computer Engineering)
- Mr. Ramkumar Bhavani Sivaraman (Electrical and Computer Engineering) (On TA)
- Mr. Bin Chen, Graduate Student, (Mechanical Engineering)

Note:

One graduate assistantship was offered to a student. He failed again to obtain appropriate visa to US, however. We have to find the temporary substitute (Mr. Bin Chen) for the FEMLab simulation.

## Management Progress

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

## Management Problems

Some delays have been experienced when dealing with various vendors regarding some of the parts needed in our new apparatus.

## Technical Progress

- One paper regarding the new experimental setup is near to complete.
- After consulting the MIT group and engineers from various vendors, we have determined that the following parts shall be used in our new apparatus:
  - Inner crucible from Zircoa Company
  - Outer crucible, stainless steel beaker from VWR
  - High vacuum feedthrough from MDC
  - High vacuum type flange from MDC
  - Heat jacket from Watlow company
- We did some study and calculation on Motor and Shaft design

- We ran FEMLAB to do simulations for oxygen concentration distributions in our setup due to stirring.

### **Technical Difficulties**

- The memory overflow problems continued to trouble us. More memory sticks were purchased to upgrade the computer systems.

### **Plans for the Next Quarter**

- Finish the mechanical drawing of the apparatus for machining.
- Contact various vendors for the shipping of our orders
- Start to assemble the pieces we will receive
- Continue the oxygen concentration simulations using FEMLAB