

Abstract Submitted  
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**Experimental Analysis of Single Phase Buoyancy driven flow inside a Rectangular closed Loop for a Bottom Finite Heat Sink configuration** PANDURANG RAJIWADE<sup>1</sup>, RAJENDRA VEDULA<sup>2</sup>, Indian Institute of Technology Bombay — Natural circulation due to the presence of a heat source and heat sink in a closed loop is well reported phenomenon. There are very few studies where the heat sink capacity is finite while the source continues to be a constant wall flux/temperature one and there are no studies available where the heat sink is located below the heat source. The heat removal capacity of heat sink in such cases decreases with time and no steady state conditions can be expected. An experimental and numerical investigation for single phase natural circulation in a rectangular closed loop with water as working fluid is reported in this study. The heat sink is a fixed volume of water and is located at bottom of the loop such that the sink has a lower elevation with respect to heat source which is a constant power electric heater. Flow rate in the loop and also temperature of the heat sink as a function of time are presented. It is observed that a circulation is established soon after heater is powered on and the heat is removed effectively. A one dimensional numerical code for predicting the circulation flow rate and heat sink temperature based on standard formulations available in the literature was used to predicting experiment results and comparison was noted to be reasonably good.

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