

## **HEAT TRANSFER AND HYDRODYNAMICS IN THERMOSYPHON LOOP WITH HEATED CHANNELS OF DIFFERENT CROSS-SECTION CONFIGURATION**

**Kaban'kov O.N., Sukomel L.A., Yagov V.V., Zubov N.O.**  
Department of Thermal Physics,  
National Research University "Moscow Power Engineering Institute",  
111250, Moscow, Krasnokazarmennaya, 14, Russia  
E-mail: kon09.tiger@yandex.ru

### **ABSTRACT**

Experimental natural circulation loop has been designed and put into operation to study heat transfer and hydrodynamics at boiling under low reduced pressures. The paper presents experimental data on wall temperature measurements at natural circulation of water under atmospheric pressure. Various heat and flow regimes in the flow up section of the loop have been studied: pure single-phase convection, pure flow boiling and mixed regimes. Low frequency flow instability has been observed in all mixed regimes. The instability led to temperature and flow rate fluctuations, which amplitudes were very high at some regimes. Wall temperature fluctuations have been also recorded. Joint analysis of flow rate and wall temperature fluctuations is presented. Experimental data on ensemble averaged wall temperature distributions along the heated section are compared with calculated ones according to the 1D and 2D numerical models.