

NUMERICAL SIMULATION OF PULSATIONS IN VAPOUR CHANNEL OF LOW-TEMPERATURE RANGE HEAT PIPES

A.V. Seryakov, A.V. Konkin

OJSC "SKTB RT", Nechinskaya street 55, Veliky Novgorod, Russia 173021

e-mail: seryakovav@yandex.ru

Abstract

The results of the numerical simulation of pulsations in the vapour channel, close to Laval nozzle, of short low-temperature range heat pipes (HP) are presented. The numerical results confirmed the experimentally obtained increase of the frequency of pulsations in the vapour channel of short HP with increasing overheat of the porous evaporator relative to the boiling point of the working fluid. Experimental determination of pulsation frequencies was carried out with the help of the installed in the cooled top covers of the heat pipes capacitive sensors, which were served electromagnetic pulses from an external generator. When heated the heat pipes evaporator, starting from a certain boundary value of the thermal power electromagnetic pulses became modulated. It is connected with the beginning of boiling in the evaporator, and the formation of a large amount of vapour that leads to a rapid increase in pressure and termination boiling in the evaporator, and the occurrence of the pulsations in the vapour channel.