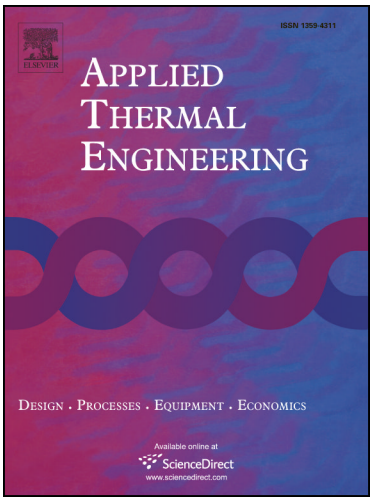

The effect of heating power distribution on the startup time and overshoot of a loop thermosyphon with dual evaporators

Hainan Zhang, Shuangquan Shao, Yuping Gao, Hongbo Xu, Changqing Tian

PII: S1359-4311(17)36544-4
DOI: https://doi.org/10.1016/j.applthermaleng.2017.12.130
Reference: ATE 11651

To appear in: *Applied Thermal Engineering*

Received Date: 14 October 2017
Revised Date: 28 November 2017
Accepted Date: 30 December 2017

Please cite this article as: H. Zhang, S. Shao, Y. Gao, H. Xu, C. Tian, The effect of heating power distribution on the startup time and overshoot of a loop thermosyphon with dual evaporators, *Applied Thermal Engineering* (2017), doi: https://doi.org/10.1016/j.applthermaleng.2017.12.130

The effect of heating power distribution on the startup time and overshoot of a loop thermosyphon with dual evaporators

Hainan Zhang[a,b], Shuangquan Shao[a,b,*], Yuping Gao[a,b], Hongbo Xu[a,b], Changqing Tian[a,b]

[a] Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China

[b] Beijing Key Laboratory of Thermal Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China

*Corresponding author. Tel.: +86 1082543433

E-mail address: shaoshq@mail.ipc.ac.cn (S. Shao)

zhanghn@mail.ipc.ac.cn (H. Zhang)

Abstract: Loop thermosyphon with multiple evaporators is a promising device in multi-source heat transfer. The startup performance is very important for its thermal control ability. In this paper, the effect of heating power distribution on the startup of a loop thermosyphon with dual evaporators is investigated experimentally. The startup time and stationarity under different power distributions are analyzed utilizing three parameters: peak time, transition time and temperature (pressure) overshoot. The results show that the startup process is faster and the overshoot of pressure and temperature is larger when the distribution is more uneven; Heating on one evaporator with the same heating power with the other evaporator makes the startup process longer while it makes the overshoot smaller or even disappear; The transition time is approximately twice as much as the peak time when the peak time exists.