

## Special Program in Applied Mathematics and Applied Mechanics

*A Technology to Slim Heat Pipe and Vapor Chamber*

2015 - 12 - 09 (Wed.)

10:00 - 12:00

308, Mathematics Research Center Building (ori. New Math. Bldg.)

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In this presentation, the technology of slim heat pipe and slim vapor chamber and its application in portable devices (NB, tablet, and smart phone) are introduced. Usually, slim heat pipe/vapor chamber is defined  $\leq 1$  mm in thickness. The 1D capillary limitation theory is presented. A central or partially composite wick structure, which is concerned its limited vapor/liquid channel working efficiently is adopt. In addition, the evaluation of evaporation, vapor flow, condensation and liquid flow in the porous are analyzed to explore its optimal thermal performance. Here, the designed wick structure could be usually a powder, mesh, fiber and a novel etching structure. The working fluid could be a pure water for cheap and convenient thought. At present, commercial slim heat pipe and slim vapor chamber reach a limited thickness of 0.45mm, 5~8 W thermal design for a smart phone application and 0.8mm, 10~20W for a tablet application. In the future, new heat pipe and vapor chamber technology, especially on how to keep the quality considering possible thinner design while increasing performance will continue to develop for a thinner and lighter device.

