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Advanced Thermal Energy Management of Telecoms Hardware

Kate Smith

Fluids and Heat Transfer Research Group,
Department of Mechanical and Manufacturing Engineering

Supervisor: Dr A. Robinson



Technical Background

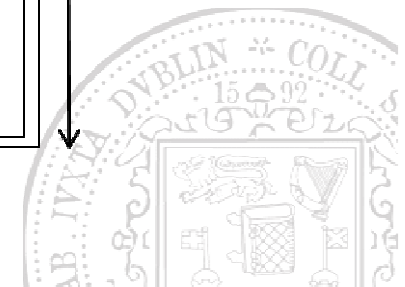
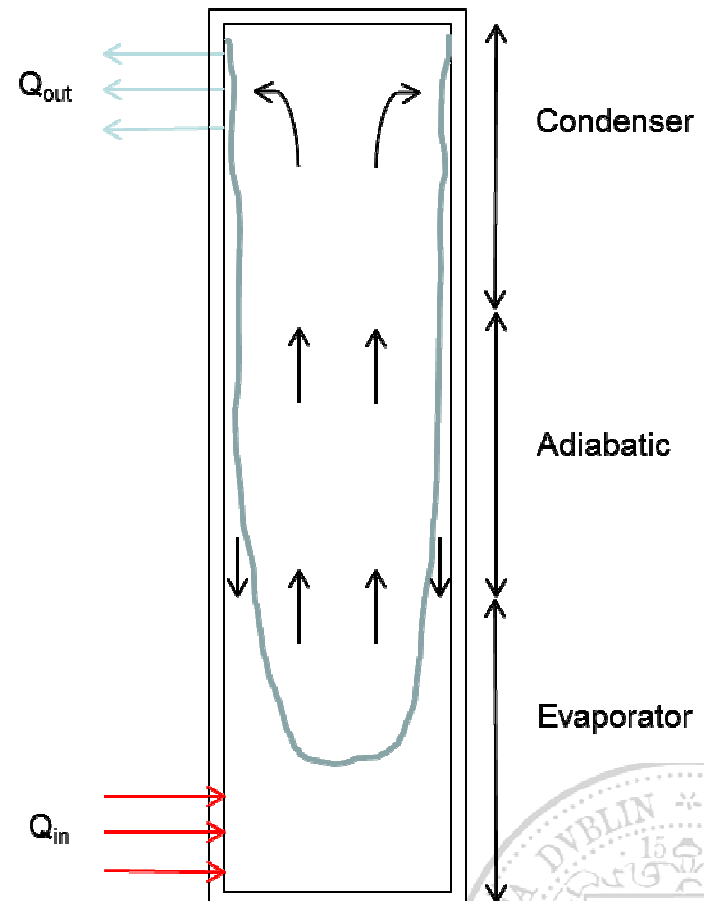
- Telecoms hardware is extremely sensitive to fluctuations in operating temperature
- Temperature regulation can consume up to 60% of the energy available
- Currently devices are cooled using standard conduction and natural convection which is becoming inadequate as power outputs increase





Technical Background

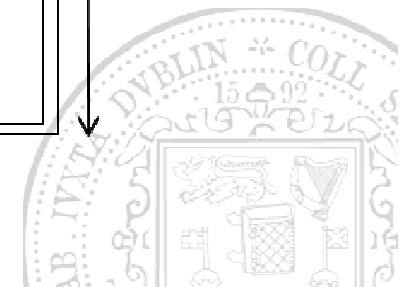
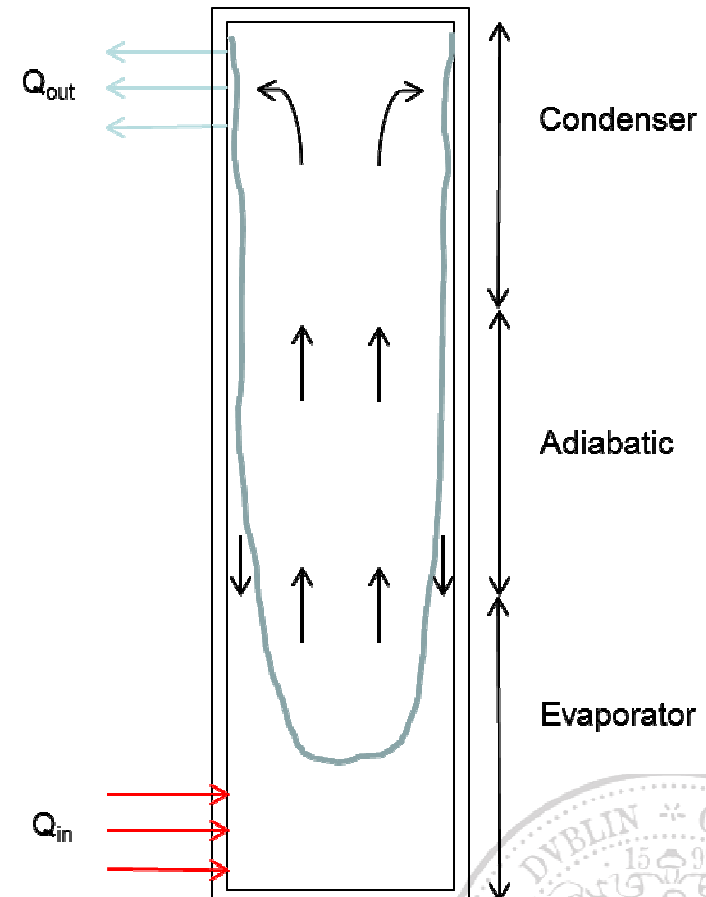
- Using two phase thermal management hardware, the energy required for temperature regulation can be reduced
- Thermosyphons are, low cost, two phase heat exchangers with high effective thermal conductivity





Project Aims

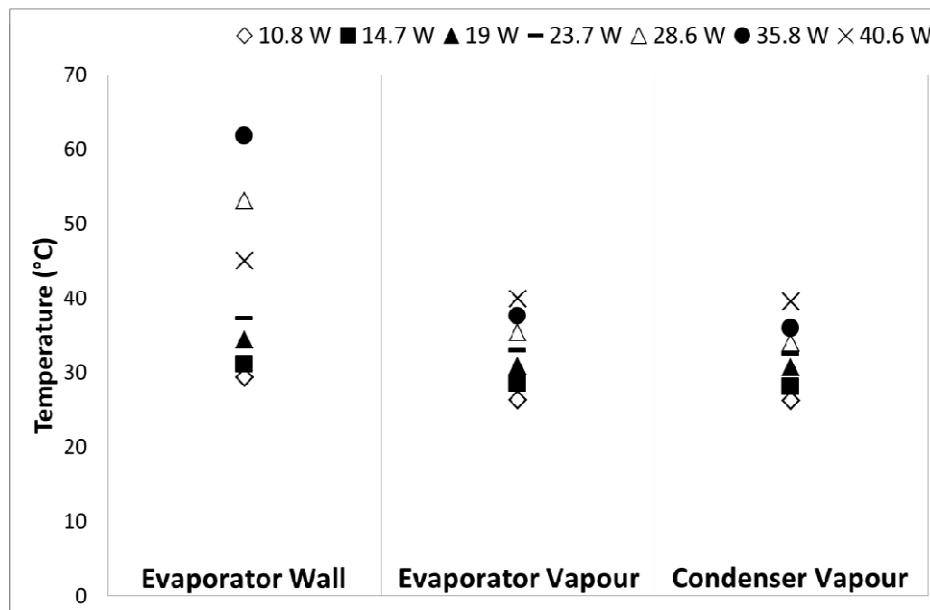
- Develop state of the art, two phase, closed thermosyphon for use in such temperature sensitive applications, with the advantage of:
 - Reduced energy consumption
 - Reduced running costs
 - Reduced form factor



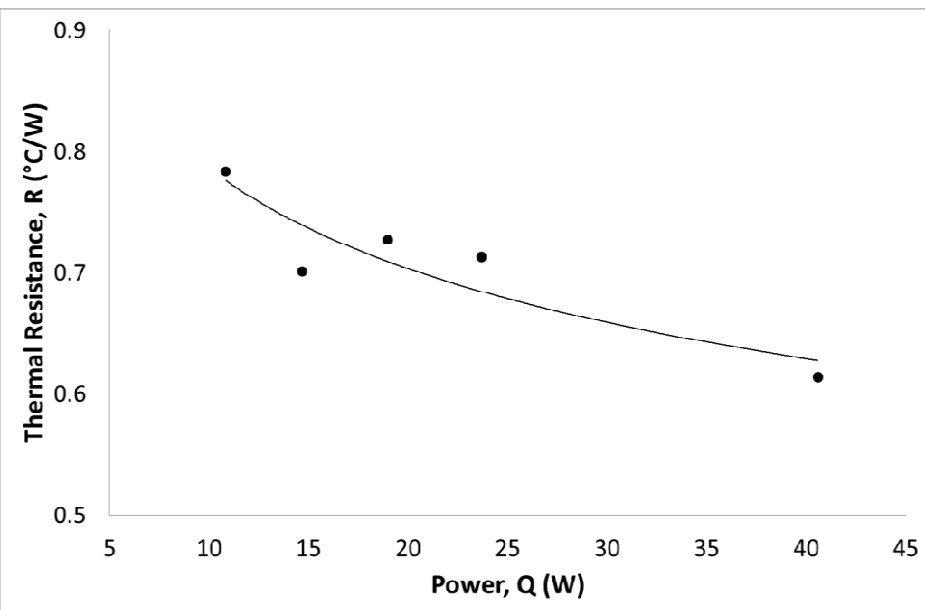


Progress to Date

- On-going: literature review of current state of the art
- Preliminary experimental thermal analysis of two phase, closed thermosyphon



Temperature distribution along thermosyphon length



Overall thermal resistance values for the evaporator wall



Near Term Plans

- Design and build thermosyphon with transparent sections to allow for flow visualisation and thermal analysis
- Further understanding of the mechanisms of heat transfer in two phase heat exchangers
 - Experimental analysis and observation

