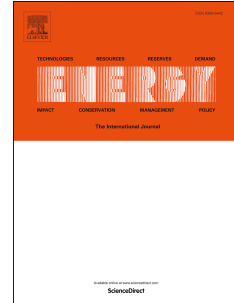


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Energy savings of hybrid dew-point evaporative cooler and micro-channel separated heat pipe cooling systems for computer data centers

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1 **Energy savings of hybrid dew-point evaporative cooler and**
2 **micro-channel separated heat pipe cooling systems for computer data**
3 **centres**

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10 **Abstract**

11 The world has entered the Age of Big Data with large data centers consuming large
12 amounts of energy. 30% to 50% of the energy delivered to a typical data center is
13 consumed by the space cooling system. Dew-point evaporative coolers and heat pipes
14 both utilizing natural cold resources can significantly reduce these refrigeration costs.

15 This paper presents two hybrid cooling systems combining dew-point evaporative
16 coolers with heat pipes for computing and data center cooling systems. The
17 energy-saving potentials of two these hybrid cooling systems were analysed through
18 calculations with comparisons with a traditional vapor compression refrigeration
19 system. The results show that the average annual coefficients of performance (COP)
20 of the ideal hybrid refrigeration systems are 33 and 34 which leads to annual energy
21 savings of nearly 90% compared with vapor compression refrigeration.

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