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## Paper 153

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## Abstract

In the recent years, performance enhancement of dew point evaporative cooler (DPEC) has been thrived due to its high performance and low energy consumption. In this study, a new idea for designing the heat and mass exchanger, which is the core of DPEC, has been introduced and its performance has been evaluated under the climate condition of Iraq. The new system consisted of one shell and a bundle of tubes. The shell is assigned as the wet channel, and the tube bundle is assigned as the dry channels. The weather data files for five different cities in Iraq were taken from the National Aeronautics and Space Administration (NASA). Thereafter, we created a typical weather data file for each city by averaging the last five years' weather data (from 2018 to 2022) so as to become a base for the numerical simulation. It was found that, under the climate condition of Basra, the DPEC reduced the dry bulb temperature by almost 30 °C (from 48 °C to 18.13 °C in July). Under Erbil climate, the system stayed operating in a stable condition, as it kept supplying air around 17.9 °C on average throughout the summer season. The system achieved the highest yearly average cooling capacity of about 721 W when it was operated under Basra climate, while it

## Keywords