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**Numerical Modeling and Optimization of Warm-water Heat Sinks** YASER HADAD, PAUL CHIAROT, State University of New York at Binghamton — For cooling in large data-centers and supercomputers, water is increasingly replacing air as the working fluid in heat sinks. Utilizing water provides unique capabilities; for example: higher heat capacity, Prandtl number, and convection heat transfer coefficient. The use of warm, rather than chilled, water has the potential to provide increased energy efficiency. The geometric and operating parameters of the heat sink govern its performance. Numerical modeling is used to examine the influence of geometry and operating conditions on key metrics such as thermal and flow resistance. This model also facilitates studies on cooling of electronic chip hot spots and failure scenarios. We report on the optimal parameters for a warm-water heat sink to achieve maximum cooling performance.

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