Abstract Submitted
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Development of Boundary Condition Independent Reduced Order Thermal Models using Proper Orthogonal Decomposition ARUN RAGHUPATHY, Graduate Student, University of Cincinnati., KARMAN GHIA, Professor, Dept of AEEM, University of Cincinnati., URMILA GHIA, Professor, Dept of MINE, University of Cincinnati, Cincinnati, OH. — Compact Thermal Models (CTM) to represent IC packages has been traditionally developed using the DELPHI-based **(DE**velopment of **L**ibraries of **PH**ysical models for an **I**ntegrated design) methodology. The drawbacks of this method are presented, and an alternative method is proposed. A reduced-order model that provides the complete thermal information accurately with less computational resources can be effectively used in system level simulations. Proper Orthogonal Decomposition (POD), a statistical method, can be used to reduce the order of the degree of freedom or variables of the computations for such a problem. POD along with the Galerkin projection allows us to create reduced-order models that reproduce the characteristics of the system with a considerable reduction in computational resources while maintaining a high level of accuracy. The goal of this work is to show that this method can be applied to obtain a boundary condition independent reduced-order thermal model for complex components. The methodology is applied to the 1D transient heat equation.

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