



Department of Mechanical and Aerospace Engineering, IITB

Industry Lectures

Refrigerant-Free Electrocaloric Air-Conditioner

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Air conditioning contributes to more than 20% of all green-house gas emissions and hence is always under regulatory pressure. Regulations in Europe and now more aggressively in US are driving current systems to lower GWP footprint and higher efficiencies. New sustainable cooling technologies are needed to help us curb the pace of global warming across the world. We are currently developing refrigerant-free technologies like electrocaloric that could enable broad disruption across the HVACR industry.

In this talk, we present our work on modeling electrocaloric systems and performance prediction of an electrocaloric based heat pump system under standard rating conditions. Further, a summary of the experimental evaluation of the first direct-air electrocaloric heat pump module is presented. A multi-physics finite-element model was developed to provide pretest predictions. The experimental results compare well with the model predictions.



About the speaker

Dr. S. Ravi Annapragada is an Associate Director, Disruptive HVACR Innovation at Carrier Global Corporation; specializing in identification and development of sustainable HVACR technologies. He is the author of 40 peer reviewed papers in the area of alternate heat pumps, solid-state cooling, and heat transfer and has filed >30 patents (6 granted so far). He is currently an Executive Member of the ASME Heat Transfer Division. He is a recipient of multiple awards including 2016 EPPD ASME Young Engineer Of The Year, 2008 ASME best paper award, 2009 InterPACK best poster award. He was previously an associate editor for the Journal of Electronics Packaging. He was the principal investigator on multiple DOE projects previously.