上海交通大学自动化系
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Concentrating Solar Electric/Thermal Power Cogeneration: System Design,Transient Analysis, and Control Perspectives

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Abstract:

Solar energy is one of the most abundant renewable sources for clean power generation. High-concentration photovoltaics (HCPV) is a highly promising technology to directly convert plentiful solar energy to electricity. However, even for the most advanced HCPVs, about 60% of the concentrated solar energy is rejected as waste heat; therefore, it is desirable to utilize the massive waste heat from HCPV modules with advanced heat engines, such asmicroscale organic Rankine cycle (MORC). This talk presents some research progresses onmicro power generation cycle design, multiphase thermal-fluid transient analysis and control challenges in advanced solar power cogeneration systems. Perspectives of next-generation concentrating solar power technologies will also be introduced.

Biography:

Dr. Tiejun Zhang has been an assistant professor of Mechanical Engineering at the Masdar Institute of Science and Technology, UAE since 2011. He was a visiting faculty at the Device Research Lab in the Mechanical Engineering Department, Massachusetts Institute of Technology (MIT) during 2011-2012. Prior to joining the Masdar Institute, Dr. Zhang was a postdoctoral research associate at the Rensselaer Polytechnic Institute (RPI), where he served as a principal researcher of the US Office of Naval Research MURI project “System‐Level Approach for Multi‐Phase Nanotechnology‐Enhanced Cooling of High‐Power Microelectronic Systems”. He has over 50 peer‐reviewed publications. As an active member of IEEE and ASME, he has been an invited reviewer for over 20 international journals and got involved in many conference organizing activities. His current research interests include energy process dynamics and control, concentrating solar electric & thermal power cogeneration, multiphase thermal fluids on micro/nano-structured surfaces, energy-efficient cooling of high-power microelectronics and photonics.