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SCHOOL OF
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College of Engineering, Architecture and Technology

MMME SEMINAR SERIES

Additive Manufacturing of a SiC based Heat Exchanger for Harsh Environments

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ABSTRACT

Harsh environments and operating conditions of power generation from renewable energy sources is necessitating development of components and systems using advanced materials. Attributes of ceramics and their composites that make them the materials of choice are their high-temperature mechanical properties, corrosion and creep resistance, etc. This presentation will discuss the opportunities for ceramics and composites specific to concentrated solar-thermal power. One specific application is the need for a high-temperature heat exchanger that can operate above 700°C and up to 20 MPa fluid pressures for efficient heat transfer in the future concentrating solar power plants. At these temperatures and pressures, metal heat exchangers degrade in structural performance. In this presentation, design and development of a SiC-based heat exchanger using binder jet based additive manufacturing technique will be discussed. Results on heat transfer testing of the fabricated SiC heat exchanger prototypes will presented. Finally, on-going efforts in the process scale-up of the ceramic heat exchanger will be highlighted.

ZOOM MEETING