INNOVATIVE THERMAL EXCHANGE SYSTEMS THROUGH ADDITIVE MANUFACTURING AND COMPUTATIONAL DESIGN

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ABSTRACT

Heat conversion systems are key to energy management in a variety of sectors, including renewable energies, industrial processes and electronic cooling [1]. European projects such as 4TunaTES [2] and ThumbsUp [3] are examples of advances in material efficiency and scalable design that highlight the role of innovative computational methods and additive manufacturing in improving thermal energy systems. Thus, additive manufacturing (AM) has proven to be a revolutionary approach to the design and manufacture of complex, high-performance thermal systems. Using additive manufacturing and advanced computational methods, it is possible to optimize thermal efficiency, reduce material consumption and improve the durability of these systems [4].

This minisymposium explores the relationships between computational design and additive manufacturing for thermal conversion applications. Topics of interest include topology optimization and generative design for lightweight; efficient thermal structures; multiphysics simulation of heat-fluid interactions in AM-manufactured systems. Advances in computational methods for the design of lattice and porous structures for thermal management; and finite element analysis of innovative structures for heat exchanger applications. Case studies demonstrating AM-based innovations in thermal conversion systems. Addressing the challenges of scaling up and validating AM for industrial thermal applications.

The main objective of this minisymposium is to bring together researchers, engineers and industry professionals to share advances and determine future directions in the field. By focusing on the interaction between AM and computational engineering, the event aim to create a collaborative platform that stimulates innovation in thermal conversion systems.

REFERENCES

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