KEYNOTE LECTURE - ISTEGIM 2019: 294372

Development of high efficiency compact recuperators for micro gas turbines

Michel Delanaye

MITIS SA, Belgium

The lecture will focus on the development of design and modelling of high efficiency counter flow heat exchangers currently used by MITIS as recuperators for small micro gas turbines. A recuperator is a gas/gas heat exchanger which recuperates the heat from one stream to preheat combustion air. For small gas turbine, the recuperator plays an important role to achieve a high cycle electric efficiency. Challenges are to obtain high efficiency, low pressure losses and to be able to sustain the very high temperatures (above 700°C) in a corrosive environment while maintaining the cost as low as possible. Compactness is important since it reduces the amount of costly material used to build the recuperator. The lecture will detail the design methodology based on advanced CFD 3D modelling developed by MITIS in conjunction with reduced order modelling to achieve optimized heat exchangers. Manufacturing aspects will also be highlighted.