

**REGENERATIVE STIRLING MACHINES FOR THE PRODUCTION OF WORK,
HEATING AND COOLING: THERMO-PHYSICAL PHENOMENA AND
TECHNOLOGICAL CONSIDERATIONS**

by

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Abstract:

Based on the historical thermodynamic cycle of Stirling, we will approach different machines which represent alternative conversion energy devices. A Stirling machine uses a gas that undergoes transformations through compression, heating, expansion and cooling in alternating flows. The flow of the compressible gas generates thermal and fluidic losses function of pressure, velocity and temperature gradients which appear in the components such as the cylinders, the heat exchangers and the regenerators. In order to design and optimize these machines, transient measurements are necessary and need to be adapted to the different geometries and time scales. We will present results concerning thermo-physical phenomena in oscillating flows and different technological applications.

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