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EXPERIMENTAL ANALYSIS OF THE PERFORMANCE OF A MEDIUM TEMPERATURE SOLAR COOLING PLANT

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Highlights

- Low scale solar cooling plant
- Solar cooling with concentrating collectors and double effect absorption chiller
- Performance analysis in off-design conditions

ABSTRACT

Summer air conditioning represents a growing market in buildings worldwide, with a significant growth rate observed in European commercial and residential buildings. Available heat-driven cooling technologies can be used in combination with solar thermal collectors to reduce the load caused by air conditioning on the electric utilities and to reduce the environmental impact. This work reports the results of a performance analysis of a medium-temperature solar cooling plant. This prototype plant, which was installed in an RSE facility, was based on a double-effect water absorption chiller coupled with a solar field (parabolic trough collectors). Experimental tests were performed during the summer under the design and off-design conditions. A higher performance, in terms of the primary energy saving, was observed in comparison with a traditional HVAC system and in comparison with low-temperature solar cooling plants.

Keywords

Solar cooling,

Parabolic trough collectors,

Primary Energy Ratio,

Primary Energy Saving.

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