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## **EXERGY ANALYSIS OF A SOLAR STIRLING ENGINE ASSEMBLY**

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### **Abstract**

A thermodynamic model for studying the overall efficiency and power output of a solar assembly using a Stirling engine is presented. It is based on the application of the energy and exergy balance equations to the system components. The results of the proposed model are generated as a function of solar incident radiation whose analytical estimation is presented. The numerical application is set for a solar assembly operating in Bucharest, composed by a parabolic dish mirror, a plane receiver for concentrating the solar radiation on a solar Stirling engine that is coupled to an electric generator. Receiver and gas temperatures are determined hourly along a day, and so are the performances of both the engine and whole assembly. The distribution of exergy destruction rates is emphasized between the components.

*Key words:* exergy analysis, exergy destruction rate, solar Stirling engine

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