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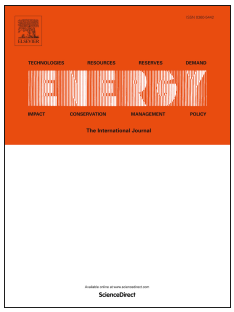

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A comprehensive modeling of a Lead Telluride thermoelectric generator

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Abstract

Modeling thermoelectric generator (TEG) performances plays an important role in guiding the design of TEGs to achieve better efficiency. However, a rigorous 1-D TEG modeling performance has not yet been conducted, which prevents reliable prediction of TEG performance. In this work, a detailed 1-D model has been developed to take into account temperature-dependent thermoelectric material properties, heat loss due to radiation and conduction, and Thomson effect. A Lead Telluride (PbTe) TEG was chosen as a sample module and the modeling results agree very well with the experimental results, which proves how powerful the presented detailed 1-D model can be used to predict and validate TEG experimental results. TEG

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