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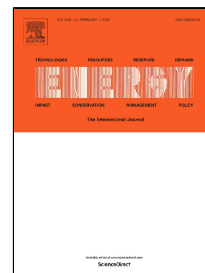
High Efficiency Thermoelectric Cooperative Control of a Stand-alone Solid Oxide Fuel Cell System with an Air Bypass Valve

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1 **High Efficiency Thermoelectric Cooperative Control of a Stand-**
2 **alone Solid Oxide Fuel Cell System with an Air Bypass Valve**

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12
13 **Abstract:**

14 Power tracking, thermal management and system efficiency optimization are three
15 key issues of ensuring high performance and long life time for a SOFC system from the
16 view of practical application. In this paper, a novel control strategy is proposed to
17 cooperatively manage the three competitive issues by maintaining thermal constraints
18 and optimizing system efficiency while conducting fast load tracking. Firstly, a
19 validated high fidelity SOFC system model incorporating a one-dimensional stack
20 model is constructed according to physical laws and chemical kinetics. With this model,

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