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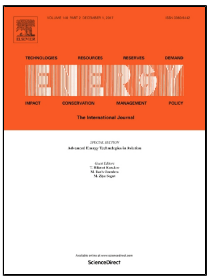

Efficiency, thrust, and fuel consumption optimization of a subsonic/sonic turbojet engine

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Efficiency, thrust, and fuel consumption optimization of a subsonic/sonic turbojet engine

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Abstract:

This paper presents a rigorous investigation for efficiency, thrust, and fuel consumption optimization of a subsonic/sonic turbojet engine. A thermal model of the turbojet engine is developed for optimization investigation. A many-objective optimization problem is formed by considering maximization of thermal efficiency, propulsive efficiency, specific thrust and minimization of thrust-specific fuel consumption of turbojet engine and solved using multi-objective heat transfer search (MOHTS) algorithm. Results are obtained as a set of Pareto-optimal points for the many-objective problem. Comparative results of many-objective and multi-objective optimization are presented on the two-dimension objective space. Design points having 70.95 % thermal efficiency, 60.23% propulsive efficiency, 0.0162 kg/s/kN specific fuel

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