

عنوان مقاله:

Combined Methods in Preliminary Micro Scale Gas Turbine Diffuser Design – a Practical Approach

محل انتشار:

دوماهنامه مکانیک سیالات کاربردی, دوره 11, شماره 3 (سال: 1397)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

Micro scale gas turbines are low cost, simplified versions of full scale jet engines. A unique feature of their design are centrifugal compressor impellers that are selected from automotive low cost, high quality turbocharger components. The present article is dedicated to the practical design of a micro scale centrifugal compressor diffuser that suits a reduced scale, turbojet engine. The idea of using a simplified method comes from the requirement from fast geometry generation for a prototype design. The chosen approach is suitable when the time is crucial and available resources are limited. The chosen simplified analytical model is based on turbomachinery physics. The obtained results are verified by detailed data from successful designs such as KJ۶۶, MW۵۴ and TK۵۰. For a prototype design, GT۶۰ results were compared with a numeric simulation in the ANSYS CFX environment. The difference in isentropic efficiency, numerical prediction in comparison to compressor flow map was less than ۳%. This is acceptable for preliminary calculations due to the difference in compressor stator design.

کلمات کلیدی:

Centrifugal compressor, Diffuser, Jet Engine, Preliminary design, Turbomachinery, RC turbine

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