

A Compressor Map Optimizing Tool for Prediction of Compressor Off-Design Performance

Authors : Zhongzhi Hu, Jie Shen, Jiqiang Wang

Abstract : A high precision aeroengine model is needed when developing the engine control system. Compared with other main components, the axial compressor is the most challenging component to simulate. In this paper, a compressor map optimizing tool based on the introduction of a modifiable β function is developed for FWorks (FADEC Works). Three parameters (d density, f fitting coefficient, k_0 slope of the line $\beta=0$) are introduced to the β function to make it modifiable. The comparison of the traditional β function and the modifiable β function is carried out for a certain type of compressor. The interpolation errors show that both methods meet the modeling requirements, while the modifiable β function can predict compressor performance more accurately for some areas of the compressor map where the users are interested in.

Keywords : beta function, compressor map, interpolation error, map optimization tool

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