MATCHING DESIGN OF AERO ENGINE CYCLE PARAMETERS BASED ON MULTIDISCIPLINARY OPTIMIZATION TECHNIQUE

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Key Words: *Multidisciplinary, Integration, Matching Design, High Bypass Ratio*.

The matching design problem of the aero engine cycle parameters was solved by using the coupled iteration of aircraft/engine integration and aero-engine multidisciplinary optimization method, which was based on the multidisciplinary optimization research ideas. The 250 kN grade take-off thrust engine installed on the B767-200ER was chosen as an example.

The optimization matching must consider two aspects, one of which is taking vehicle requirements as guidance and the other is to make optimization on engine cycle parameters under the premise of considering factors like engine weight, size, air system, material temperature limits, etc. Applying above research approach, aero engine cycle parameters matching design process based on multidisciplinary optimization would be shown as figure 1.

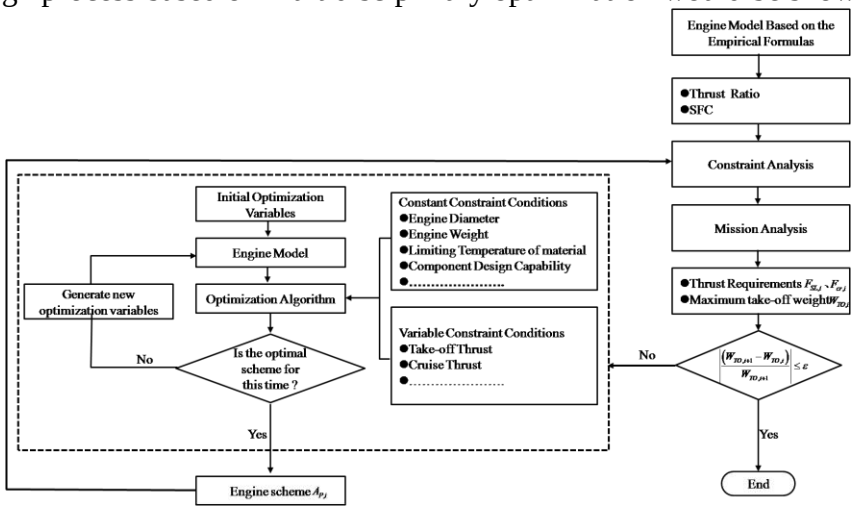

Fig 1: Figure of Research Approach

The optimization results showed that: under the premise that engine satisfying aircraft mission, size, weight, material temperature, etc., the maximum aircraft takeoff weight of B767-200ER was reduced about 2.7% and the fuel consumption was reduced about 5.25%; the optimized engine weight was basically the same as that of the original PW4056 engine; the method and research ideas used in this paper were reasonable and feasible, and had good practical value for engineering.

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