

小型渦輪噴射引擎二維向量推力動態性能描述與應用在水平單擺平衡之驗證

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摘要

A two-dimensional thrust-vectoring nozzle is designed for a P-80 micro turbojet engine. The transfer function of this thrust-vectoring engine is examined through its frequency response from the nozzle turning angle. The dynamic model of the thrust-vectoring engine is validated through the equilibrium of a horizontal pendulum. The steady-state performance of a different length of the nozzle and a different turning angle is measured to determine the optimal geometry of the nozzle and its reasonable operating range. The frequency-domain technique is used to identify the transfer function between the turning angle and the side force from the engine. From the test data and the simulation show that the parameter of PID controller, the upper limit of nozzle turning angle, and the installed position of the thrust-vectoring engine affect the marginal amplitude of the horizontal pendulum mainly.

關鍵字：thrust-vectoring nozzle、frequency-domain、pendulum