

Multiphysical simulation of the servo valve in the fuel supply system of auxiliary power unit

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Summary

In this paper, the three-dimensional model of a servo valve working in the fuel supply system of auxiliary power unit (APU) for the gas turbine engine is studied with numerical simulation of multiphysical system. The physics of electromagnetics, structural dynamics, and fluid dynamics are expressed in the form of independent system of partial differential equations, respectively. A commercial code named COMSOL is used to simulate the essential physics of the servo valve system, and the extracted data is used for the simulation of entire servo valve, which is coupled with torque motor, bushing tube, and valve orifice, etc. The valve is simulated under SIMULINK environment with MATLAB, and static and dynamic simulation is done with a series of appropriate numerical algorithm.

keywords: Parameter study, Servo valve, Torque motor, Valve characteristics.

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