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Author: Dr. Yanping Gu
China

Mr. Fanjian Zeng
China

THE ESTABLISHMENT OF DYNAMIC MODEL FOR THE SINGLE-PHASE FLUID LOOP SYSTEM

Abstract

With Space exploration missions becoming deep and complicated, the fluid loop technology has become one of the essential measures to solve the problem of heat collection, transport and dissipation for high heat flux situations. But the thermal control system based on fluid loop technology will face disturbances such as the external heat flux fluctuating frequently, the heat load time-varying. So, it is necessary that the fluid loop system can adjust itself adaptively to maintain the stability of the temperature of the controlled object. In this paper, based on the theoretical analysis, the related heat transfer and flow process in the single-phase fluid loop system was analyzed and simplified. Dynamic models of system components and the simulation platform for dynamic characteristics were established, which laid the foundation for the study of the closed-loop control scheme for the fluid loop system.