Optimal Control System Design for Fuel Processing System

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ABSTRACT

This paper presents that an optimal control system which consists of both feedforward and state-feedback controllers is designed using a well-developed linear quadratic Gaussian and loop transfer recovery (LQG/LTR) method for a fuel processing system (FPS).This FPS uses natural gas as fuel and reacts with atmospheric air through a catalytic partial oxidation (CPO), after pure supply to proton exchange membrane fuel cell (PEMFC) stack . The objectives of this paper are to use the Matlab/Simulink software tool to model such an optimal control system and to analyze the system performance. The proposed method achieves better performance and robustness properties in both time-domain and frequency-domain responses.

Keywords : Fuel processing system ; catalytic partial oxidation ; proton exchange membrane fuel cell ; Matlab/Simulink

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