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Control of Proton Exchange Membrane Fuel Cell Power System Using PI and Sliding Mode Controller

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Abstract : Conventional controller (PI) applied to a DC/DC boost converter for the improvement and optimization of the Proton Exchange Membrane Fuel Cell (PEMFC) system efficiency, cannot attain a good performance effect. Thus, due to its advantages comparatively with the PI controller, this paper interest is focused on the use of the sliding mode controller (SMC), Stability of the closed loop system is analytically proved using Lyapunov approach for the proposed controller. The model and the controllers are implemented in the MATLAB and SIMULINK environment. A comparison of results indicates that the suggested approach has considerable advantages compared to the traditional controller.

Keywords : DC/DC boost converter, PEMFC, PI controller, sliding mode controller
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