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Abstract:

In this paper, a fuzzy logic controller (FLC) is proposed to overcome the problems of the existing unified power flow controllers (UPFCs) and to provide the dynamic power flow control through transmission lines. Although many studies have been focusing on developing UPFC control strategies for power flow control through simulation, there is a lack of experimental validation of different UPFC controller and its performance in real-time operation. In order to investigate the performance of the proposed FLC based UPFC, a laboratory prototype has been developed using two 6-pulse converters. The six-bus power system network model is chosen as test system. The shunt and series controller for both PI and FLC-based UPFC prototype are designed in MATLAB/Simulink using Speedgoat performance real-time target machine. The UPFC prototype is tested on six-bus power system network model to verify its capability. The results revealed that the UPFC prototype had successfully controlled the power flow dynamically in transmission line with enhanced accuracy. In addition, other power system parameters have been improved significantly.