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Fuzzy PID control method for outer loop voltage of bidirectional DC-DC converter

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This paper introduces the fuzzy PID control method for outer loop voltage of bidirectional DC-DC converter. In recent years, with the rapid development of new energy technology, bidirectional DC-DC converter has been widely used in the new energy vehicles. Bidirectional DC-DC converter is a kind of strongly nonlinear system. How to make the converter system work steadily and fast is a hot research area. A bidirectional DC-DC converter is a strongly nonlinear system. The traditional PID control is known for its simple algorithm and easy design, but the parameters cannot do well in dynamic performance and static performance, which affect the final control effect. Taking the Boost converter as an example, a PI control for the voltage inner loop and a Fuzzy PID control for the voltage outer loop was proposed to improve disadvantages of the traditional PID control. And the Boost simulation experiment was built in Matlab/Simulink. The simulation results show that compared with the traditional PID control, this control method can effectively solve the nonlinear problems of bidirectional DC-DC converter, improve the response of bidirectional DC-DC converter, and reduce the output voltage fluctuation.

Biography

Guangya Liu has completed his PhD and is a Professor and researcher level Senior Engineer. His research interests are power, electrical engineering and automation.

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