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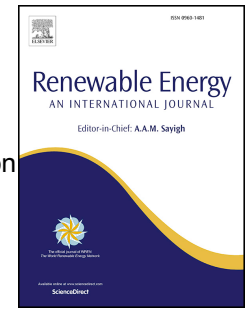

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A Novel Beta Parameter Based Fuzzy-Logic Controller for Photovoltaic MPPT Application

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Abstract

In this paper, a novel beta parameter three-input one-output fuzzy-logic based maximum power point tracking (MPPT) algorithm is presented for the photovoltaic (PV) system application. The conventional fuzzy-logic controllers (FLCs) exhibit obvious limitations such as their dependence on the user's knowledge about the system and complicated rules. Furthermore, they show inherent dilemma between the rules number of FLC and the universality for various operating conditions, which is revealed and explained with details in this paper. Thus, a novel FLC is proposed by introducing a third input: an intermediate variable β. It can simplify the fuzzy rule membership functions and cover wider operating conditions. The dependence on the user's knowledge about the system is reduced. The converging speed for transients is improved and oscillations around the MPPs are completely eliminated compared with conventional MPPT methods. Typical operation

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