

Adaptive Backstepping Controller of a single-phase Multicellular inverter connected photovoltaic systems

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Abstract

In this paper, we are considering the problem controlling a single-phase 3-celles inverter with LC output filter connected photovoltaic systems. The control objective is to generate, at the system output, a sinusoidal voltage with amplitude and frequency fixed by the reference signal. The controller is designed using the backstepping approach in its adaptive versions and the Lyapunov stability argument. The whole system is described by fourth order nonlinear mathematical model and controlled by using the backstepping approach and tools from Lyapunov stability. To demonstrate the performance of methods, some results of the overall system simulations are presented under MATLAB/Simulink software.

Keywords

Backstepping approach, Lyapunov stability.