عنوان مقاله:

Design and simulation of Sliding Mode Power Controller for Variable-Speed Wind Energy Conversion Systems

محل انتشار:

چهارمین کنفرانس مهندسی برق و الکترونیک ایران (سال: 1391)

تعداد صفحات اصل مقاله: 5

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خلاصه مقاله:

This paper describes a manner in which the power generation control of wind energy conversion systems, operation can be achieved by means of the sliding mode control. In order to maintain the constant output power, the variable-speed wind turbine should run at different speed when wind speed changes. In this paper a nonlinear control system is introduced to get this purpose base on the second-order model of variable-speed wind energy conversion systems (VS-WECS). Sliding mode controller is one of the approaches which have some advantages, such as the parameter insensitivity and the realization simplicity, over the other approaches. A sliding mode control strategy is proposed to ensure stability in operation regions and to impose the ideal feedback control solution despite model uncertainties. The proposed control approach has been simulated on a 1.5-MW three-blade wind turbine to evaluate its consistency and performance. Simulation results demonstrate that the presented controlling method can effectively achieve .constant power control of variable speed wind power system under large-scale changing of wind speed

کلمات کلیدی:

Wind power system; Sliding mode control; nonlinear control; Energy conversion