عنوان مقاله:

Sliding-Mode-based Improved Direct Active and Reactive Power Control of Doubly Fed Induction Generator under Unbalanced Grid Voltage Condition

محل انتشار:

مجله انرژی تجدیدپذیر و محیط زیست, دوره 3, شماره 2 (سال: 1395)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Gholam Reza Arab Markadeh - Department of Electerical Engineering and Center of Excellence for Mathematics, Sharekord University, Sharekord, Iran

Nasrin Banimehdi - Department of Electerical Engineering and Center of Excellence for Mathematics, Sharekord University, Sharekord, Iran

خلاصه مقاله:

This paper proposes an improved direct active and reactive power control (DPC) strategy for a grid-connected doubly fed induction generator (DFIG) based wind-turbine system under unbalanced grid voltage condition. The method produces required rotor voltage references based on the sliding mode control (SMC) approach in stationary reference frame, without the requirement of synchronous coordinate transformation, and therefore causes a simpler design for power control system. Under unbalanced grid voltage condition, two control targets obtained simultaneously, i.e., removing stator active and reactive power oscillations. Moreover this method reduces the THD of stator current. Also it is shown that the proposed control method not only has a high-speed dynamic response but is stable during wind speed and system parameters variations. Simulation results for a ۲kw DFIG confirm prominence of proposed control strategy.

کلمات کلیدی:

Doubly fed induction generator, Wind Turbine, Direct power control, Unbalanced grid voltage, Sliding mode control