

Improved Sliding Mode Controller for Maximum Power Point Tracking of WECS.

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Abstract: Due to the major discrepancy between the exigent demands regarding the electrical energy quality and the irregular characters of the wind, which is characterized by a random and instantaneous speed variation, it is suitable to determine the optimal operating point that maximizes as much as possible the efficiency of the obtained electrical energy in the grid. The present paper deals with the above-mentioned problem by introducing an additional low-frequency component in the standard sliding mode control strategy. The purpose is to maximize the power point tracking of wind energy and to reduce the mechanical loads where the variable wind speed is considered. This idea has the ability to drive the conversion system to the optimal operating point by which the switched component problem, commonly called also the chattering problem of the standard sliding mod control strategy that should be solved. To examine the validity of the proposed idea, the obtained results are compared with those given by the standard sliding mode control strategy wherein our method can ensure a better dynamic behavior of the wind energy conversion system.

Keywords : Maximum Power Point Tracking MPTT, Standard and Improved Sliding mode controller, Induction Generator IG