

Title: Comparative study of power converter topologies and control strategies for the harmonic performance of variable-speed wind turbine generator systems

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Abstract: Power converters play a vital role in the integration of wind power into the electrical grid. Variable-speed wind turbine generator systems have a considerable interest of application for grid connection at constant frequency. In this paper, comprehensive simulation studies are carried out with three power converter topologies: matrix, two-level and multilevel. A fractional-order control strategy is studied for the variable-speed operation of wind turbine generator systems. The studies are in order to compare power converter topologies and control strategies. The studies reveal that the multilevel converter and the proposed fractional-order control strategy enable an improvement in the power quality, in comparison with the other power converters using a classical integer-order control strategy. (C) 2010 Elsevier Ltd. All rights reserved.

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