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Photovoltaic Stations with NPC Inverters Adjusted by Specific Control and PWM Schemes and Algorithms

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Abstract

This paper presents brief overview of the use of modulated neutral-point-clamped (NPC) inverters (NPCINs) with specific control and modulation schemes and techniques as basic workhorses of transformer-based grid-connected photovoltaic (PV) stations. Therefore, the using of NPCINs with modified schemes and algorithms of synchronous PWM insures providing in PV installations both synchronization and symmetry of the winding voltage of power transformer, and minimization of common mode voltage in these renewable energy systems. Examples of the use of modulated NPCINs to adjust several topologies of NPCIN-based PV stations with multi-winding power transformer are presented.

Keywords: photovoltaic systems, renewable energy sources, switching frequency, windings, pulse width modulation, inverters, voltage source inverters, pulse width modulation, voltage control, digital simulation, harmonic analysis

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