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(57) Abstract :
ABSTRACT In cascaded multilevel converters, variations in power cell irradiances lead to variations in duty cycles among those cells when preserving maximum power point tracking (MPPT). Since it is proportionate to the output voltage and current distortions, the difference in cell duty cycles is undesirable. In order to address this, a multilevel architecture for photovoltaic (PV) applications is suggested, in which a H6 bridge power cell is employed rather than an H-bridge one. The suggested converter maintains MPPT operation by injecting power at a lower voltage from the shaded cells when there is a discrepancy in solar irradiation between the power cells. This change enables us to maintain good output voltage and current waveform quality by enabling all power cells to maintain an equal duty cycle regardless of the weather. An experimental prototype and a comprehensive simulation model are constructed in order to evaluate the efficacy of the suggested remedy. The acquired data demonstrate that, in comparison to the cascaded H-bridge, the suggested topology offers noticeably better output voltage and current characteristics.

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