Voltage unbalance mitigation in LV networks using three-phase PV systems

In this paper a new method is proposed to mitigate voltage unbalance caused by single-phase solar inverters in low voltage (LV) networks. The method is based on uneven reactive power absorption and injection by three-phase solar inverters. Independent control of each phase is performed to achieve this uneven injection. The average values of phase voltages at the connection points of the photovoltaic (PV) inverters are used as the references for the balancing algorithm. Voltage unbalance mitigation is achieved by use of this method in different scenarios with variable three-phase and single-phase inverters penetration in a realistic LV grid. In addition, the overvoltage is reduced by using this method.

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