Voltage rise (VR) due to reverse power flow is an important obstacle for high integration of Photovoltaic (PV) into residential networks. This paper introduces and elaborates a novel methodology of an index-based single-point-reactive power-control (SPRPC) methodology to mitigate voltage rise by absorbing adequate reactive power from one selected point. The proposed index utilizes short circuit analysis to select the best point to apply this Volt/Var control method. SPRPC is supported technically and financially by distribution network operator that makes it cost effective, simple and efficient to eliminate VR in the affected network. With SPRPC none of the previous PV inverters need to upgrade and can retain their unity power factor to not to conflict with current grid codes. Comprehensive 24-h simulation studies are done on a modified IEEE 69-bus Network emulating a traditional residential power system with high r/x ratio. Efficacy, effectiveness and cost study of SPRPC is compared to droop control to evaluate its advantages.
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