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Protection of Utility Network with Solar Power Generation

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Abstract: This paper designs a protection scheme method (PSM) for detection of faulty condition incident on the utility grid network with solar photovoltaic (PV) power generation. ... **View more**

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Abstract:

This paper designs a protection scheme method (PSM) for detection of faulty condition incident on the utility grid network with solar photovoltaic (PV) power generation. A fault index (FI) is designed by decomposing the current waveform by application of Hilbert transform (HT), Stockwell transform (ST), and Alienation coefficient (ACF) for detection of faulty conditions. An index for ground with fault (GFI) is also designed to identify ground involvement during faulty event. Fault classification is performed using faulty phase numbers and GFI. It is established that PSM effectively identified and categorized the fault events including fault on phase-A and ground (AGF), fault on phases-A& B (ABF), fault on phases-A& B and ground (ABGF), fault on all phases (ABCF) and fault on all phases with ground (ABCGF). Performance of PSM is better compared to ACF based PSM. Study is validated on IEEE-13 nodes test system interfaced with a solar PV system.

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