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Ph.D. Topics:	**Mitigation Techniques for Power Quality Issues of SPV Grid Interfaced System**

Ph.D. Research Findings:

The objective of the research work carried out is to develop the controlling strategies for an efficient and reliable Gird interfaced SPV system. Challenges that are addressed by employing controlling aspects include extraction of maximum output power from SPV modules by employing MPPT technique and energy recovery strategy in case of partial shading. Furthermore, control strategies are developed for controlling voltage source converter (VSC) operation so that power quality can be maintained of a gird interfaced SPV system in case of dynamic disturbances such as unbalanced non-linear load and variable solar irradiance. In this work, a simple power electronics switching circuit is designed to enhance the output power of the partially shaded SPV system. The research work utilizes a two-stage power conversion topology for the three-phase grid integration of a solar PV system. The chief objectives of the proposed control strategy are extraction of maximum power from PV generation system and then to supply this power into grid along while maintaining power quality. To achieve this objective, three control techniques are developed, namely, Zero Attracting based Mixed Norm Least Mean Square (ZA-MNLMS), Reweighted Zero Attraction parameter based Mixed Norm Least Mean Square (RZA-MNLMS) and Robust Adaptive technique employing the Inverse Hyperbolic Sine Function (RA-IHSF) based algorithms for a two-stage power conversion of a SPV system interfaced with the grid along with the feeding of nonlinear loads. The performance of the system to implementation of proposed algorithms illustrates that it is more expedient as compared to conventional adaptive filters (for example, LMS and LMF) based algorithms showing improved dynamic response with less computational burden. The developed control approaches provide the interfacing of SPV with the grid while maintaining grid current sinusoidal and balanced in dynamic disturbances such as load unbalancing and varying solar insolation. The proposed scheme provides load balancing, reactive power demand and mitigates harmonic content of grid current along with power factor correction.