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## Harmonic elimination in a PV fed multilevel inverter integrated with a micro grid

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Power quality issues and energy crises are the major apprehension of this century. Most of the literature in this area of research discusses the problems related to natural resource depletion, environmental impact, the rising demand of new energy resources and the challenging technologies which can overcome these problems. The renewable sources of energy such as solar, wind, biomass, hydro, geothermal and so forth are zero polluting in nature and have large research scope. The output of such energy resources are mostly in the form of DC which needs to be converted into AC for feeding the AC loads. This requires DC to AC converters. Multilevel converters are gaining high reputation because even in high power applications, the renewable energy sources such as photovoltaic arrays, fuel cells and wind turbines etc., can be used as DC input to the multilevel inverter with higher efficiency. Thus, this paper focus on the harmonic elimination of a grid tied multilevel inverter fed with PV arrays. The nonlinear characteristic of PV array and the power electronics switches in the inverter introduces harmonics in the power system. According to IEEE 519 standard, for a 69KV and below system, the Total Harmonic Distortion (THD) value should be less than 5% and the individual harmonics should be less than 3%. Filtering increases the complexity and cost of the system. Therefore, the best alternative is to use suitable low frequency switching scheme for the multilevel inverter to mitigate harmonics. Thus, the investigators propose to use Newton-Raphson based Selective Harmonic Elimination (SHE) technique to eliminate the harmonics and compare it with the conventional PWM technique. The entire system will be simulated using MATLAB™/SIMULINK™.

### Biography

Tilak Thakur has completed his BSc Engineering and MSc Engineering (Electrical) from BIT Sindri, Ranchi University, India and obtained PhD Engineering (Electronic Instrumentation) from Indian School of Mines, Dhanbad, India. He is a Senior IEEE Member apart from Life Member of Institution of Engineers, India and ISTE Member. He has authored more than 135 research papers in the international and national journals of repute and conferences. Presently, he is the Senior Associate Professor in the Department of Electrical Engineering, PEC University of Technology, Chandigarh. He has been Editorial Member of various international journals and conference. His research interest is in power and energy mechatronics and he has published a book on mechatronic with Oxford University Press. He is also a Member of Board of Studies for Panjab University (PU), Chandigarh and Punjab Technical University (PTU), Jalandhar and India Smart Grid Forum (ISGF).

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