



## Measurement and Investigation of PCC Point Harmonics in a Grid Connected Photovoltaic System

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**Abstract-** This paper work presents analysis and harmonic measurement at point of common coupling (PCC) when Photovoltaic (PV) system is connected to utility grid. Use of power electronic converters while integrating PV to grid may introduce harmonics, due to this power electronic converter deteriorates power quality. Photovoltaic (PV) system is connected to grid via 3-phase 3-level voltage source converter (VSC). The maximum power point tracking (MPPT) is implemented using incremental conductance technique (IC). An AC/DC/AC IGBT based SPWM converter is considered for study. THD measurement of the different possible cases of PV system integrated to grid at PCC has been carried out in MATLAB/Simulink environment. Finally, harmonic mitigation and power quality improvement at PCC using passive filter and control technique of complete system is proposed and proved by different simulation results.

**Index Terms-** MPPT, Power Quality (PQ), Renewable Energy Sources (RES), THD Measurement, Utility Grid.

This will affect operation of sensitive loads and results in higher system losses.

In order to exchange power with the grid certain requirements must be met to ensure the quality and stability of the power system. The standards for connecting distributed resources with an electric power system are defined in IEEE Std. 1547 [3] and standards for Power Quality are defined in IEEE Std. 1159 [3]. The harmonic content standards are taken from standard known as IEEE Std. 519- 1992 [3]. Passive filters are one of the classic method to solve harmonics problems.

The presentation of this paper shows the simulation analysis, THD measurement of the integrated PV system connected to utility grid using different advanced power electronic based device and different control algorithm strategy at PCC.

### II. PV SYSTEM