



Fig 13. Grid Phase Voltages and Grid Line Currents a) Phase Voltages b) Line Currents under Minimum Insolation Level c) Line Currents under Maximum Insolation Level

4. Conclusion

An interconnection of a hybrid energy system consisting of a PV system and a three phase AC power grid feeding a shunt DC motor with a constant load power through an AC/DC converter has been investigated. The proposed interconnection contains a class D chopper besides an AC/DC converter.

The class D chopper performed the job of a maximum power point tracker (MPPT) adequately. The Class D chopper was controlled by the perturb and observe (P&O) control technique.

The AC/DC converter was controlled by a voltage oriented (VOC) controller. The AC/DC converter was able to operate in rectifier mode as well as in inverter mode. The voltage oriented controller (VOC) prevented the AC grid from drawing or generating reactive power. Moreover, the voltage oriented controller (VOC) conditioned the quality of the grid line currents to a certain acceptable extent. Extensive Simulink simulations results had demonstrated and validated the satisfactory performance of the proposed hybrid energy interconnection.

Future work is to confirm or enhance the performance of the proposed interconnection by the practical implementation of the proposed interconnection.

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