

# **Grid integration of multiple PV inverters with reduced number of interfacing transformers— A dedicated controller for elimination of DC current injection**

## **Abstract**

The injection of dc current offset into ac networks may impacted the lifespan of the distribution system equipment including isolation transformers and measurement devices and in serious event may cause equipment's malfunction. This paper intents to eliminate dc current offsets in the output currents using a combinational of proportional-integral (PI) and proportional resonance (PR) controls embedded in one inverter unit. Resultant output currents of this method are sinusoidal and clean from dc offset before entering the point of common coupling. This method gives advantages for transformerless option for group of interfacing inverters in the medium-scale solar farm or in arrangement of inverters restricted in a small locale. Moreover, the use of expensive and high-accuracy measurement sensor nor complex transformer can be omitted, whilst indirectly give positive impact to the operational cost of the farm. The simulation verifications proved the usefulness of the proposed method by introducing varying unknown dc offset levels in the phase currents, and a dedicated dc offset suppressor inverter able to successfully eliminate the dc offset to zero. The validity of the proposed method is demonstrated in simulation using MATLAB/Simulink.

## **Keywords**

DC current suppression method; DC offset; Grid interfacing inverter; PR control