**ABSTRACT**

Renewable energy is derived from natural resources that are replenished constantly. The commonly used renewable energy systems include photovoltaic cells and fuel cells. A suitable DC-DC converter is proposed for highly efficient renewable energy systems. Interleaved Boost Converter (mC) topology is discussed in this paper for renewable energy applications. The advantages of interleaved boost converter compared to the classical boost converter are low input current ripple, high efficiency, faster transient response, reduced electromagnetic emission and improved reliability. Three cases of interleaved boost converter have been considered and analysed. Two-phase mc's with (i) the front end inductors magnetically coupled (ii) uncoupled inductors and (iii) inversely coupled inductors performance have been analyzed and compared. The output voltage ripple, input current ripple and inductor current ripple of the three types of converters are compared. The waveforms of input, inductor current ripple and output voltage ripple are obtained using MAT LAB/SIMULINK. The design equations for IBC have been presented. Using the results obtained from simulation the best of the three IBC is inferred.