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IV. Simulation Results

The simulation of the proposed model is developed and verified using MATLAB/Simulink. A parallel integration of solar and wind generators are connected at the point of common coupling (PCC) with the load as depicted in Fig. 1 considering the following specifications provided in Table I.

The considered voltage variation is 4-24 V (peak) for solar and 19-27 V (rms) for wind turbine generation. The desired reference voltage required at the output is kept at 40 V. The simulated and measured waveforms of output voltage (V_{out}) and output current (I_{out}) are shown in Fig. 9, from this it can be seen that the proposed controller design optimally maintains the voltage within permissible power quality requirements, irrespective of the voltage transience experienced due to solar irradiance and wind speed and hence satisfies the load requirement of the system.

V. Conclusion

In this paper, a parallel connection model of boost converter has been studied for multi-input renewable energy sources. Initially, the system was mathematically modelled taking small signal variations into consideration, and establishment of the respective current equation, voltage equation and characteristic transfer function of the system. Then the stability of the system was evaluated. Further, a model for parallel connection for different operating modes was simulated in MATLAB/Simulink environment. From the simulation results, it can be inferred that after some initial transience, ripples in the output voltage are minimised ($\pm 0.015V$). Therefore, the stability of the system is maintained within the required permissible limits.

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