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Thesis title:

A New Multilevel Converter Configuration for High Power and High Quality Applications

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Citation:

A main contribution of this project is to improve power electronic converter topologies used in renewable energy systems. Therefore, a high quality output voltage with a regulated magnitude and frequency is required for the grid connected or residential applications. Multilevel converters are basically designed for high power and high quality applications; however, the number of components and the complexity of their configuration limit their industrial performance. To address this problem, different new configurations of asymmetrical multilevel converters have been proposed and experimentally validated for renewable energy systems in this project. Perusing this further, output voltage of the renewable energy systems such as wind turbine and photovoltaic varies significantly. To resolve the DC link voltage disturbances in multilevel converters supplied by these sources and to simplify the control complexity of multilevel converters we have also proposed, developed and validate new multi-output DC-DC topologies joined with asymmetrical multilevel converters with control strategies.