

Abstract

Ahmed Khamis Mohamed

Electric Spring Enhanced Decoupled Dual Function Operation: Bus Voltage Controller and Renewable Energy Grid Integration

Electric Springs (ES), a converter topology connected in series with non-critical loads, has been recently developed to restore bus voltages to their reference value in case of voltage sag/swell by injecting/absorbing reactive power into/from grid. In this paper, a dual-function ES is proposed with an enhanced decoupled controller, offering additional capability of Renewable Energy Sources (RES) grid integration. Hence, the proposed ES controller is capable of simultaneously injecting active power, extracted from a PV arrays, into grid and mitigating bus voltage fluctuations. Simulation results verify the proposed ES effectiveness when varying irradiance level and bus voltage states.