National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Disturbance Observer Control (DOC) of Dual Active Bridge (DAB) Converter for isolated Solar DC Charging system applications
Speaker	: A Susmitha (Rollno : 919ee5113)
Supervisor	: Prof. K. Ratna Subhashini
Venue	: Seminar Room EE401
Date and Time	: 24 Jan 2025 (3:00 PM)
Abstract	: Due to increase in energy demand and climate change triggered by CO_2 emission, Electric Vehicle technology has become inevitable in the transportation sector. EV&rsquos are generally of 3 types: Battery EV&rsquos (BEV), Plug-in hybrid EV&rsquos (PHEV) and Fuel cell EV&rsquos. The fuel cell-based vehicles are limited and are in development stage due to the high cost of Hydrogen production and risk involved in storage. So, Battery EV&rsquos, Plug-in hybrid EV&rsquos are gaining wide attention. The move from IC engine vehicle to EV&rsquoS increasing rapidly than expectation but major barriers for EV commercialization are size of battery, time taken to recharge, inefficient power conversion due to multiple stages and grid instability during peak hours. A hybrid charging station which is less grid-dependent can overcome the above barriers. Hence Solar PV based Electric Vehicle Charging Station (SPV-EVCS) is now drawing more attention for design engineers and researchers. In SPV-EVCS isolated DC-DC converters play an important role. Dual Active Bridge Converter (DAB) is one of the promising topologies because of auto adjust bidirectional power flow, wide voltage conversion gain range and ZVS capability. It is essential to model the DAB converter and design its controller with specified steady state and dynamic performance. DAB is modelled using &ldquoReduced order model technique&rdquo, which is accurate enough for its controller design. Disturbance Observer Control (DOC) is used for controlling the output voltage of DAB and for better dynamic performance. A 6.4 kW DAB Converter is modelled, and its DOC control is simulated using PLECS simulation.