MODELLING AND SIMULATION OF DC CHOPPER USING MATLAB/SIMULINK

This thesis is presented in partial fulfillment for the award of the Bachelor of Electrical Engineering (Hons)

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ABSTRACT

A four Quadrant DC-to-DC converters used to control the DC motor drive that require forward and reverse motoring as well as forward and reverse braking, DC motor drive system controlled by Pulse Width Modulation (PWM) technique are expected to replace the conventional phase controlled system. This is due to their simple control, high ratability, low cost and fast response. A DC Chopper converts directly from DC-to-DC and also knows as DC-to-DC converter. It is considered a dc equivalent of an AC transformer with a continuously variable turn's ratio. DC Chopper may be classified according to the number of quadrant of the Vd-Id diagram and polarities in which there are capable of operating. The polarity of the output voltage and the direction of energy flow cannot be changes. The output of the DC Chopper maybe controlled using the (PWM), generated by comparing a triangle wave signal with an adjustable dc reference and hence the duty cycle of the switching pulse could be varied. This algorithm is required to provide a stream of PWM train to turn on and off the switches that will synthesize the required dc-dc conversion, the implementation DC Chopper requires different bi-directional switching arrangements depending on the desired operation requirement of the four quadrants defined. This paper present work on development of four quadrant DC-to-DC converter using the Power System Block Set (PSB) within the MATLAB/Simulink (MLS) enviroment. The output is being synthesized using Pulse Width Modulation (PWM) technique. The four quadrant DC Chopper is supplied by a V DC voltage source; the load takes the form of a pure resistive, inductance with battery E representing a back emf of a dc motor.

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