Design Dynamic Modelling and Implementation of PI Controller for Speed Control of BLDC Motor in Mobility Application

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Abstract- Brushless DC (BLDC) motors are becoming very popular in the field of electric and mobility vehicles. Since the motors which are being used in mobility vehicles has incorporated Brushless DC motors for its movement. Hence; it is very important to precise control of the speed of brushless DC motor for these applications.

It is difficult to derive the mathematical modelling of BLDC motor because it is three phase back EMF non-linear system. It is very important to give proper sequences of commutation and appropriate control using PI control algorithm to run BLDC motor smoothly. Therefore, a dynamic modelling and simulation of the BLDC motor and PI algorithm is developed in MATLAB Simulink. The obtained model is tested using the embedded dsPIC controller and inverter drive circuit. The experiments with different load and speed have been performed and there results are reported.

Keywords- BLDC Motor; mobility, dynamic model, PI controller