



PM ENHANCED SENSING OF INTERNAL EMF VARIATION-

A TOOL TO STUDY PMBLDC/AC MOTORS

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Abstract- The search for replacement of commutator and brushes in conventional DC motors by electronic commutator has resulted a class of Permanent Magnet Brush Less (PMBL) motors. The operation of PMBL motor requires synchronization of coil currents with the instantaneous rotor position. The applied voltages of higher magnitudes must have same zero crossings as that of speed induced back EMF of the respective stator windings. The complexity of rotor position detection in PMBL motor is overcome by obtaining a replica of stator induced EMF using additional auxiliary stator and rotor. The auxiliary stator winding induced EMF is amplified using Power Operational Amplifier (P-OPAMP) and the output is connected to the main stator winding. The proposed scheme has been tested at laboratory scale and has been found to be a promising alternative scheme for operation of PMBLDC/AC motors.

Index terms: Permanent Magnet Brush Less (PMBL) Motors, Power Operational Amplifier (P-OPAMP), PM Enhanced Sensing, Magnetic switch, FEM analysis, Hall Effect sensor & latch.