EE568 Project 4

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1 Introduction

DW stator topologies are the major stator type used in PMSMs. This is due to their near sinusoidal MMF which yields a high main harmonic winding factor and low torque ripple. It was not until very recently that it was shown that the right choice of slot and pole combination for a FSCW stator could yield a high main harmonic winding factor which is essential to having a high average torque [**?**]

2 Literature Review

analytical modelling of the stator MMF and machine equivalent airgap function are essential to correct calculation of the stator magnetic field and inductances, and subsequently torque and torque ripple. analytical formulae for the stator MMF. [**?**].

2.1 Torque Density

2.2 Torque Ripple

3 Analytical Calculation & Sizing

3.1 specific machine constant

3.1.1 Magnetic Loading

3.1.2 Electrical Loading

3.2 Rough Dimensions

airgap clearance	0.7mm
rotor diameter	290mm
axial length	68mm

Table 1: Rough Dimensions

number of slots	
number of coils	
cable size	

Table 2: Winding Configurations

back-core thickness	19.07mm
number of coils	
cable size	

Table 3: Machine Parameters

3.3 Winding Configurations

3.4 Machine Parameters

3.5 Material selection

3.6 Electrical circuit parameter

4 FEA Modelling

5 Comparison & Discussion

6 Conclusion

7 Draft

1[?] 2[?] 3[?] 4[?] 5[?] 6[?] 7[?] 8[?] 9[?] 10[?] 11[?] 12[?] 13[?] 14[?] 15[?] 16[?] 17[?] 18[?] 19[?] 20[?] 21[?] 22[?] 23[?] 24[?]

back-core thickness	19.07mm
number of coils	
cable size	

Table 4: Material selection