EE568 Project 4

Baris Kuseyri

June 24, 2020

Contents

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	$0.7 \mathrm{mm}$
rotor diameter	$290 \mathrm{mm}$
axial length	$68\mathrm{mm}$

Table 1: Rough Dimensions

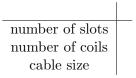


Table 2: Winding Configurations

back-core thickness	$19.07 \mathrm{mm}$
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

back-core thickness	$19.07 \mathrm{mm}$
number of coils	
cable size	

Table 4: Material selection