

Design And Optimization of Homopolar Transverse Flux Innovative Electrical Machine

Name: Kumar Harsh

Supervisor Name: 1. Dr. Seshadhri Srinivasan

Kalasalingam Academy of Research and Education

2. Prof. Dr. François Bernot

FranceCol Technology, France

This Research Program is the Part of Collaboration between Milgracias E-Bike India Pvt. Ltd. And ACIC-KIF. AS Milgracias is the part of Incubator. Research will be undertaken by Dr. Seshadhri Srinivasan as Internal Supervisor. Where the design and optimization of electrical machines will take place under his supervision to enhance the efficiency and performance of electrical machines.

Abstract: The Proposal describes the design and optimization of transverse flux innovative homopolar electrical machine. The Project proposes different rotor construction according to the various possible alternatives of applications of the proposal in a rotating electrical machine:

- a. BLDC synchronous magnet motor.
- b. BLDC synchronous magnet less motor.
- c. Squirrel Cage Induction motor.

Introduction:

The Circular shaped stator winding is surrounded by U-shaped stator teeth. A single-phase, two-phase, three-phase or polyphase machine, obtained by axially stacking elementary machines properly phase-shifted relatively to each other by an electric angle substantially equal to one electric turn (360° divided by the number of pairs of poles) divided by the number of phases, said angular phase shift created at the Stator. The novel motor design will provide simple magnetisation of the rotor. Only one magnet is required for single phase in BLDC synchronous magnet motor. Ring-shaped coil is easily manufactured. Due to large current density and force density high torque can be expected. Stator coil and rotor coil are concentric. Better Cooling possibilities the existing electrical machines. Transverse flux machine produces high power and high torque, which have less constraints of structure on electric load and magnetic load This has made Transverse Flux machine desirable for direct drive applications where a high torque is required at a low rotational speed, such as traction applications, wind turbines, and wave energy converters.