Low Cost Direct Drive (In-wheel motor) For Electric Vehicles

Funding source: Innovation and Technology Fund

Funding amount: $4.1 Million

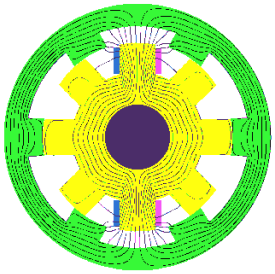
Period: July 2007- Apr 2009

Project Abstract:

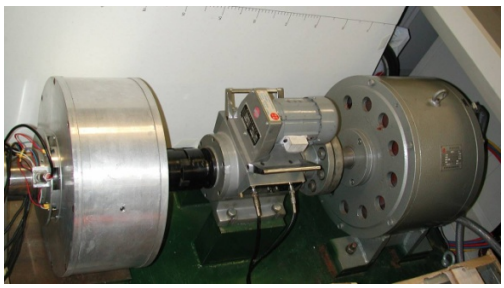
The project is to develop the in-wheel switched reluctance motor (SRM) drive to directly drive electric vehicles. It brings the motor and wheel into a single unit. The interfacing mechanical devices are eliminated. It not only reduces the cost but also reduces the weight and increases the reliability. The development includes the design of direct-drive in-wheel SRM, its characterization, and its converter drive. The project provides the suitable torque control, current control, and speed control to match the driving pattern of vehicles.

Technologies and Features of the Product Development:

- Multi-objective optimization design of in-wheel SRMs
- Multi-objective optimization control of in-wheel SRM drive
- Design of converter drive for in-wheel SRM
- Inherent fault tolerance
- Excellent power-speed characteristics
- Applicable to electric vehicles

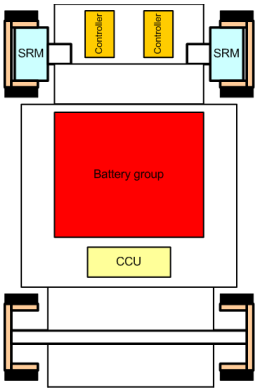


Finite element analysis



Test system of in-wheel SRMs

Sample of in-wheel SRM



Layout of EV drive

Controller of in-wheel SRM

EV prototype driven by in-wheel SRMs