

ICFD2013

OS5 Global/Local Innovations for Next Generation Automobiles

26th November, 2013.

Motor Technology for Next Generation Automotive

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TOHOKU UNIVERSITY

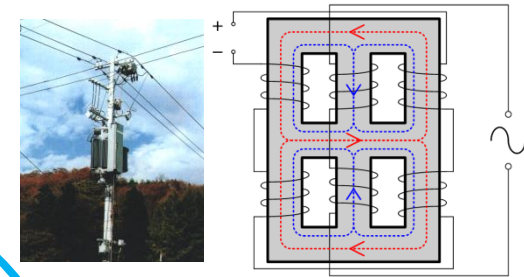
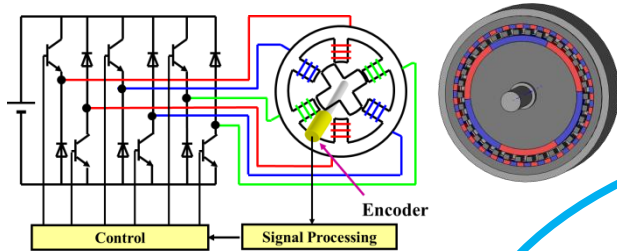
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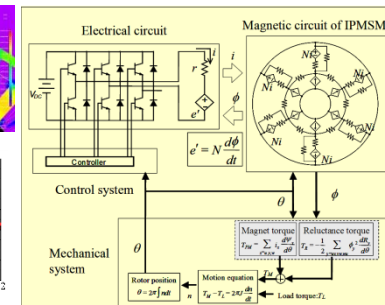
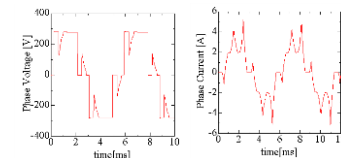
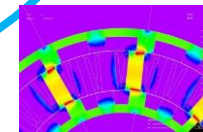
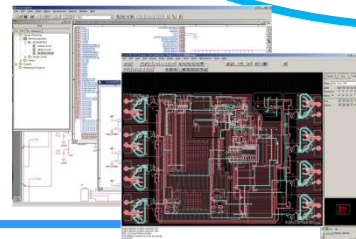
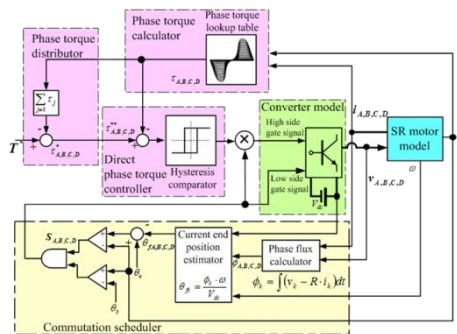
ICHINOKURA-NAKAMURA LAB.

HIGH PERFORMANCE
ELECTRIC MACHINE

HIGH QUALITY POWER
CONVERSION & CONTROL



NEXT GENERATION
ELECTRIC VEHICLE



POWER ELECTRONICS
&
CONTROL

ANALYSIS
&
SIMULATION



SR MOTOR for IN-WHEEL DIRECT DRIVE EV

Advantage of SR MOTOR

Brushless & Magnet-less

- Maintenance Free
- Saving Material/Low Cost
- No Lock at Short Circuit
- No Demagnetization
- Heat Capability

Suitable for In-Wheel DD

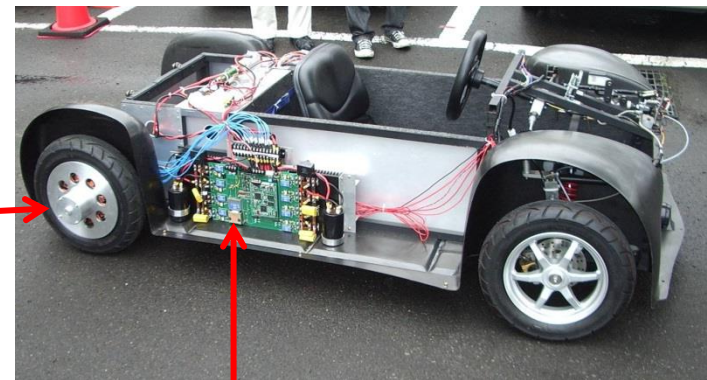
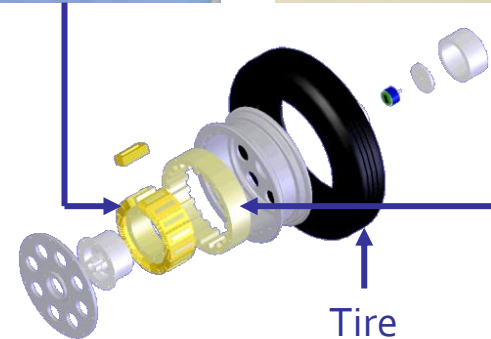
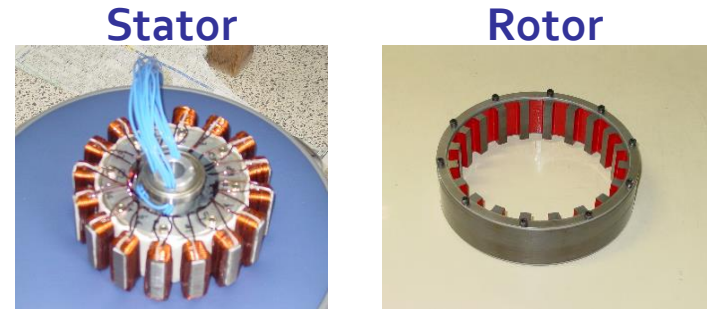
Disadvantage

- Torque Density
- Short Air Gap
- Torque Ripple
- Inverter/Wire

➔ **Axial-Gap structure**

↑ **IN WHEEL MOTOR**

- Thin Space
- Weighted direction is radial direction.



Inverter

WORLD 1st 3D STRUCTURE RARE-EARTH MATERIAL/MAGNET FREE IN-WHEEL MOTOR

