



UNSW
SYDNEY



Multi-Phase Machine Drives using Coupled-Coil Inductor Outputs

A five-phase, three-level pulse-width modulated voltage source inverter and associated modulation techniques for multi-phase machine drives. The inverter employs a coupled inductor in each phase-leg to provide three-level output voltages but only uses two switches per leg.

Competitive advantage

- Compared with the popular three-level neutral-point clamped inverter, the coupled inductor inverter uses fewer switching devices, has no dead-time and associated distortion, and the voltage on the DC-link capacitor does not need to be balanced
- Vast experience at the assessment and design of space vector modulation strategies
- Invention and modification of two carrier-based pulse-width modulation techniques to reduce the common-mode voltage for multiphase inverters

Impact

- The establishment of mathematical models of the coupled inductors, total inverter current and current stress on the DC-link capacitors, provides an insight into the way coupled inductors on the system impact on system efficiency and current stress in the DC-link capacitors.

Capabilities and facilities

- Electrical machine design experience
- Multi-phase machine design techniques
- Multi-phase drives and controls
- Low-speed, high-torque load machines and high-speed load machines

Our partners

- Shandong BOFA Power Machinery
- Motorica

More Information

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