



“Fractional Horsepower Electric Drives”

The Theme: Today, the most widely deployed electric motor drives are in the low-power range. According to the 2009 IMS research, the world market for motors having a continuous power rating between 1W and 500W is worth \$3018.1 million per year. Small electric machines are used in many fields. Consumer electronics, including desktop computers, palmtops and mobile devices use one or more small power electric drives, while medical and industrial automation account for 39 percent of all small motor sales worldwide. Other applications include the automotive sector, household appliances, aeronautics and robotics. Fractional horsepower machines are also used in microgeneration plants, especially for renewable energy conversion. The perspectives of all these markets are ever expanding.

The layout types of fractional horsepower machines and drives are manifold: fractional horsepower drives can be of the induction machine, PM synchronous and DC types, but other, less conventional machine and drive layouts are being developed to the aim of reducing production costs and to improve performances. The research on this subject follows four main directions: unconventional converter layouts, machine layouts, control logic and control techniques are currently being developed.

Components with low switching and conduction losses are currently deployed, axial-flux, transverse-flux and tubular-linear machine layouts are used in many applications, ASICs and FPGAs are increasingly used in consumer applications and sensorless control strategies are being envisaged. The push towards the increase of the power density and fault tolerance is prompting a rush towards higher integration and miniaturization of drives.

Topics of interest of this Special Section include, but are not limited to:

- power converter topologies for fractional horsepower drives
- drive control methodologies
- fractional horsepower electrical machine design, construction and verification
- dedicated control logics
- microgeneration
- fault tolerant drives.

Manuscript Preparation and Submission

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On the submitting page #1 in popup menu of manuscript type, select: SS on Fractional Horsepower Electrical Drives

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