

## Development of a Compact Permanent Magnet Axial Flux Motor Using Soft Magnetic Composite

**Authors :** Nasiru Aliyu, Glyn Atkinson, Nick Stannard

**Abstract :** With increasing demand for electric motors used in nearly all sectors of our day to day activities, which range from the motor that rotates the washing machine and dishwasher to the tens of thousands of motors used in domestic appliance. The number of applications for soft magnetic composites (SMC) material is growing significantly. This paper presents the development of a compact single sided concentrated winding axial flux PM motor using soft magnetic composite as core for reducing core losses and cost. The effects of changing the flux carrying component to pressed SMC parts are investigated based on a comprehensive understanding of the properties of the material. A 3-D finite-element analysis is performed for accurate parameter calculation. To validate the simulation, a new static test measurement was fully conducted on a prototype motor and agree with the theoretical calculations and old measured static test.

**Keywords :** SMC, compact development, axial field motor, 3DFA

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