

## Axial-Flux switched reluctance machine

### Abstract

The present invention relates to an axial flux switched reluctance machine, comprising at least a stator with poles distributed along a first circumferential path on a plane with electromagnet coils wound on at least some of the stator poles.

Partners to further develop the machine and/or to establish commercial agreements along with technical cooperation are sought.

### The Challenge

Since 2011, the abrupt increase of the raw material costs in rare earth permanent magnets has shifted interest in the field of electrical machines towards new topologies with a lower volume of permanent magnets, and even without those. This circumstance has renewed the interest for switched reluctance machines, especially in the field of electric traction.

SRM present some advantages, such as simple and robust construction and torque-speed characteristics that match very well with the needs of electric traction. However, conventional radial SRM drives have drawbacks as, for example, lower performance than permanent magnet synchronous motors or brushless D.C. motors, high torque ripple and acoustic noise.

Some studies carried out in **axial flux switched reluctance motors**; demonstrate that with this type of machine is possible to obtain higher torque density than in conventional radial flux switched reluctance machines. Therefore, the proposed axial-flux switched reluctance machine is a competitive alternative to usual permanent magnet synchronous motor or brushless DC motor for light electric traction.

### The Technology

Axial-flux switched reluctance machine with a stator and one or more rotors with a particular disposition of the stator and rotor poles with short magnetic paths and without flux reversal.

### Innovative and advantages aspects

- Machine without permanent magnets
- Use of Soft Magnetic Composites (SMC) as magnetic materials
- In-wheel or hub machine
- Modular construction
- High performance machine

### Current stage of development (Development stage or status)

A first operational prototype has been built and tested.

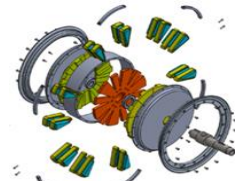
### Applications and Target Market

The machine is mainly stated for in-wheel electric traction but can be used in industrial applications such as fans, pumps and machine tools

### Reference number

MKT2019/0166\_G

**Axial-flux SRM as a competitive alternative for light electric traction.**



**No permanent magnets and high performance**



**Commercial Opportunity**

Licensing opportunity with technical cooperation

**Patent Status**

ES & WO (PCT) priority application

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