

Talk announcement

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Tuesday, Nov 18, 2025
13:45, S2 044

Design and Prototyping of Additively Manufactured Axial Flux Switched Reluctance Machine

Axial switched reluctance machines have a higher torque density compared to radial switched reluctance machines, making them a preferred option for applications that require high torque. Due to the intricate three-dimensional design of axial machines, production poses substantial challenges. Additive manufacturing has simplified the process by allowing to produce complex shapes. This study presents a systematic design approach that utilizes output equations to establish the geometrical parameters of a machine analytically. The proposed machine design was validated using 3D finite element analysis after the analytical phase. The study proposes a design feature to address the challenges associated with the mechanical assembly of a machine. This design modification introduces a lip feature on the stator segments to mechanically join all the segments. Furthermore, this study evaluates the impact of this modification on the machine's performance by comparing it to a base design without this feature. The paper outlines the fabrication of a physical prototype utilizing Selective Laser Melting employing an advanced additive manufacturing process.