

A Comprehensive Review of Axial Flux Machines and Its Applications

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Abstract : This paper presents a thorough review concerning the design types of axial flux permanent magnet machines (AFPM) in terms of different features such as construction, design, materials, and manufacturing. Particular emphasis is given on the design and performance analysis of AFPM machines. A comparison among different permanent magnet machines is also provided. First of all, early and modern axial flux machines are mentioned. Secondly, rotor construction of different axial flux machines is described, then different stator constructions are mentioned depending upon the presence of slots and stator back iron. Then according to the arrangement of the rotor stator structure the machines are classified into single, double and multi-stack arrangements. Advantages, disadvantages and applications of each type of rotor and stator are pointed out. Finally on the basis of the reviewed literature merits, demerits, features and application of different axial flux machines structures are explained and clarified. Thus, this paper provides connection between the machines that are currently being used in industry and the developments of AFPM throughout the years.

Keywords : axial flux machines, axial flux applications, coreless machines, PM machines

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