

## عنوان مقاله:

Optimal Design of Axial Flux Permanent Magnet Synchronous Motor for Electric Vehicle Applications Using GA and FEM

## محل انتشار:

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## خلاصه مقاله:

Axial Flux Permanent Magnet (AFPM) machines are attractive candidates for Electric Vehicles (EVs) applications due to their axial compact structure, high efficiency, high power and torque density. This paper presents general design characteristics of AFPM machines. Moreover, torque density of the machine which is selected as main objective function, is enhanced by using Genetic Algorithm (GA) and variation of PM characteristics, based on sizing equation and Finite Element Analysis (FEA). Moreover, torque ripple of the motor is reduced according to the effect of PM characteristics on Torque Ripple Factor (TRF). The designed machine produces sinusoidal back-EMF waveform. The results show that torque density is improved and the torque ripple is reduced. These results are validated by using 3D-FEA. Furthermore, to assess the obtained results by FEA method, an advanced vehicle simulator (ADVISOR) software is used to demonstrate the performance improvement over the Europe test drive cycles.

## کلمات کلیدی:

Axial Flux Permanent Magnet, (AFPM), Finite Element Analysis (FEA), Genetic Algorithm (GA), Torque Ripple Factor (TRF), Electric Vehicles (EVs)

## لینک ثابت مقاله در پایگاه سیویلیکا:

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