World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:9, No:07, 2015

Design of 3-Step Skew BLAC Motor for Better Performance in Electric Power Steering System

Authors : Subrato Saha, Yun-Hyun Cho

Abstract : In electric power steering (EPS), spoke type brushless ac (BLAC) motors offer distinct advantages over other electric motor types in terms torque smoothness, reliability and efficiency. This paper deals with the shape optimization of spoke type BLAC motor, in order to reduce cogging torque. This paper examines 3 steps skewing rotor angle, optimizing rotor core edge and rotor overlap length for reducing cogging torque in spoke type BLAC motor. The methods were applied to existing machine designs and their performance was calculated using finite- element analysis (FEA). Prototypes of the machine designs were constructed and experimental results obtained. It is shown that the FEA predicted the cogging torque to be nearly reduce using those methods.

Keywords : EPS, 3-Step skewing, spoke type BLAC, cogging torque, FEA, optimization
Conference Title : ICEMDS 2015 : International Conference on Electric Machines and Drive Systems
Conference Location : Stockholm, Sweden
Conference Dates : July 13-14, 2015