

## Core Loss Influence on MTPA Current Vector Variation of Synchronous Reluctance Machine

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**Abstract :** The aim of this study was to develop an electric circuit method (ECM) to ascertain the core loss influence on a Synchronous Reluctance Motor (SynRM) in the condition of the maximum torque per ampere (MTPA). SynRM for fan usually operates on the constant torque region, at synchronous speed the MTPA control is adopted due to current vector. However, finite element analysis (FEA) program is not sufficient exactly to reflect how the core loss influenced on the current vector. This paper proposed a method to calculate the current vector with consideration of core loss. The precision of current vector by ECM is useful for MTPA control. The result shows that ECM analysis is closer to the actual motor's characteristics by testing with a 7.5kW SynRM drive System.

**Keywords :** core loss, SynRM, current vector, magnetic saturation, maximum torque per ampere (MTPA)

**Conference Title :** ICRERA 2015 : International Conference on Renewable Energy Resources and Applications

**Conference Location :** Paris, France

**Conference Dates :** July 20-21, 2015