

Fast Electro-Mechanical Performance Evaluation Tool for Synchronous Reluctance Machine

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The absence of high-cost rare-earth magnet on the rotor of Synchronous Reluctance machine makes it one of the best option for an actuator in applications with high ambient temperature. Combined with an optimized rotor structure, it can deliver good performance. In the early design phase of the machine, development cost reduction of prototyping and testing can be obtained by having a fast electro-mechanical model that can evaluate the machine's essential performance: operating envelope, power factor and efficiency. Therefore this study proposes a fast analytical tool that evaluates the electro-mechanical performance of a given Synrel machine. Experimental evaluations done on a prototype machine has proven the validity and robustness of the tool. The resulting tool is ready to be used for fast electro-mechanical performance evaluation of any Synrel machine topology with any power supply and control variations.