

Elektrotechnik-Elektronik-Informationstechnik

EEI KOLLOQUIUM

DESIGN & CONTROL OF A BEARINGLESS DOUBLE U-CORE SWITCHED RELUCTANCE MACHINE USED FOR A FLYWHEEL

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Nowadays, by drastic increase of demanding energy in households and industries, Energy Storage Systems (ESS) can play a critical role to meet energy requirements in manufacturing. In fact, response to the increased energy demand will not be materialized unless renewable resources are replaced in the manufacturing cycles. These new sources can offer valuable advantages along with major challenges. In this case, ESS becomes an essential components in related to the reducing peak power demands, intermittent behavior of renewable resources power, improve transmission and distribution and maintain quality power and reliability. The point to be considered is a wide range of energy storage technologies in various types of electro-chemical, thermal, mechanical and electrical, which each of them can be quite different in the context of energy storage scale and its associated application. Although, a single storage system cannot be found in the case of meeting all the requirements for an ideal ESS, Flywheel Energy Storage Systems (FESS) can be used as a solid option for energy storage applications thanks to the recent improvements of the material characteristics, high speed electrical machines, power electronics and control systems. FESS can also deliver a good performance owing to their offered benefits such as high cycle life, low idle losses, long operational life, high round-trip efficiency, high power density, low environmental impact, low cost and simple materials.