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Graz, 02. Oktober 2023

Sehr geehrte Damen und Herren,

hiermit ergeht die Einladung des Instituts für Grundlagen und Theorie der Elektrotechnik mit der Bitte um ggf. Weitergabe in Ihrem Bereich:

GASTVORTRAG von Anna Melina Merkel

am **Mittwoch, 11.10.2023, 16:00 Uhr**, Raum HS i6, Inffeldgasse 25, 1 OG und Online

<https://tugraz.webex.com/tugraz-de/j.php?MTID=m93dfce33e04a1b78582857122aca5580>

Title:

Isogeometric Analysis for the Simulation of Rotating Electric Machines

Abstract:

In the simulation of electric machines, the accuracy of the magnetic field in the air gap between stator and rotor is important to correctly predict the behavior and performance of the machine. In the standard finite element case, the cylindrical structure of electric machines is approximated by piecewise polynomials, introducing a geometry error. This error can be avoided using isogeometric analysis (IGA), where the geometry is described exactly using NURBS. One bottleneck of IGA is the time-consuming geometry discretization which often has to be carried out manually. To avoid the need for re-discretizing the geometry during rotation of the machine in order to obtain a conforming patch-wise discretization, we investigate methods that can deal with non-conforming discretizations, such as mortaring, in the context of IGA. Furthermore, we explore tree-cotree gauging to remove the kernel of the discrete system based on the magnetic vector potential formulation. The obtained formulation allows for the straightforward use of higher-order basis functions and enables an accurate and efficient simulation of rotating electric machines.