Master/Bachelor Thesis: Investigation of electrical discharges expectancy in the powertrain of an All Electric Aircraft.

A Master/Bachelor Thesis on simulation of HV powertrains is available at the Institute of Energy Conversion and Storage (Institut für Energiewandlung und Speicherung - EWS).

Thesis work description

In the framework of All Electric Aircraft (AEA), an efficient electrical distribution system is imperative. The demand for more power is accompanied with the demand for increased voltage levels. This will increase the danger of the beginning of partial discharges (PD) which are the forerunners of disruptive discharges, and consequently the failure of the system. Therefore, the proper design of the components/system, considering different environmental conditions, is critical.

The aim of the thesis is to investigate the parameters that affect the presence of electrical discharges and verify the results through simulations using Finite Elements Analysis. Thus, the thesis work will be divided into the following:

- A comprehensive study of the parameters that affect electrical discharges
- Built and analysis of a 3D Finite Elements Analysis models for:
  - Different environmental conditions.
  - Different geometric characteristics of the components.

Prior knowledge of Finite Element Analysis as well as related software-tools like COMSOL is recommended but not mandatory. The thesis is ideal for the students who want to gain deep knowledge in electrical discharges of HV powertrains in electrical aircrafts.

For further information, please contact:

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