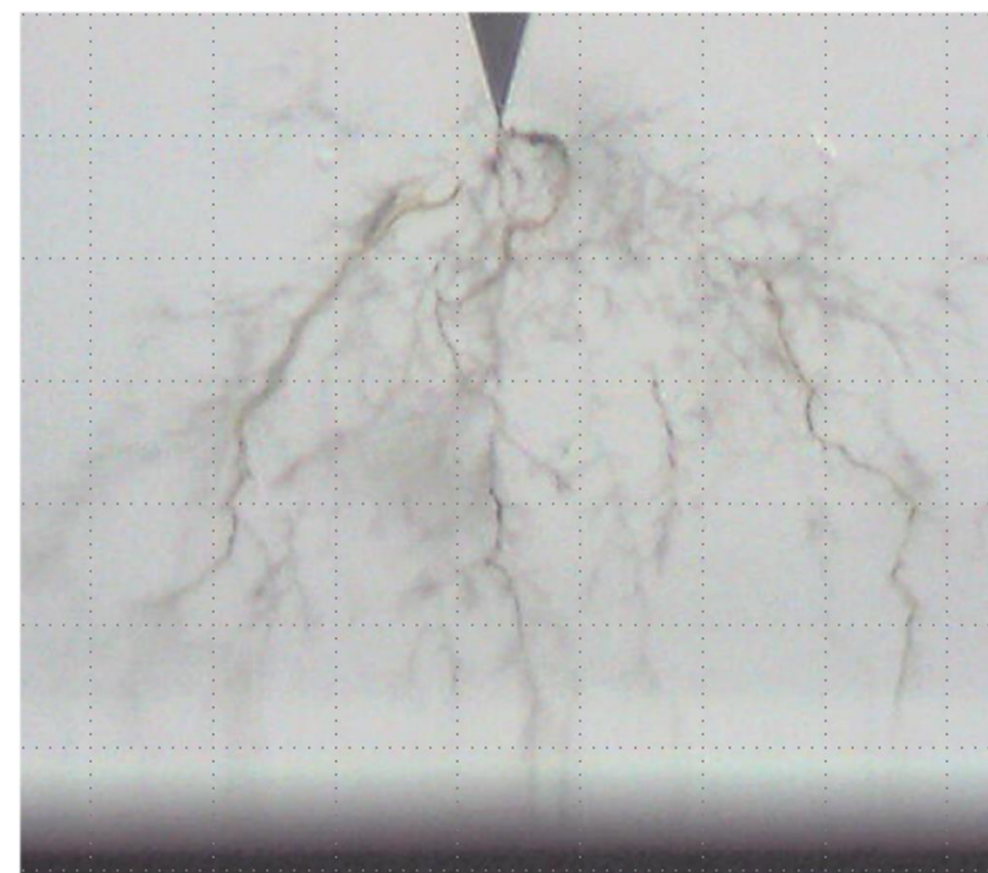


E-mobility

The reliability of electric vehicles is a key aspect to satisfy the market requirements in terms of lifetime. Recent advances in transistor technology, however, increase the electrical stress on the motor winding insulation and make it prone to partial discharges (PD), which drastically reduce the life of the electrical machine. Therefore, it has to be assessed which influencing factors are most crucial regarding the aging of the winding insulation.



Partial discharge through an insulator

Lifetime model

The influence of different environmental conditions and loads on the winding insulation is represented in an empirical lifetime model. In order to be able to generate such a model, careful statistical test planning is required. Methods for test plan optimization and acceleration of life tests are used to develop an optimal test plan. The yielded test bench results are used to parametrize a lifetime and degradation model, allowing the prediction of the winding insulation lifetime dependent on the expected field load levels.

 Temperature	 Humidity
 Electrical quantities (ΔU , dU/dt , f)	 Mechanical stress
	 Imperfections

Research meets Industry

The project is being carried out in cooperation with the Institute of Power Transmission and High Voltage Technology (IEH), which is responsible for the PD measurement. Further cooperation partners are companies from the German Federation of Industrial Research Associations (AiF). The project is funded by the BMWi.

