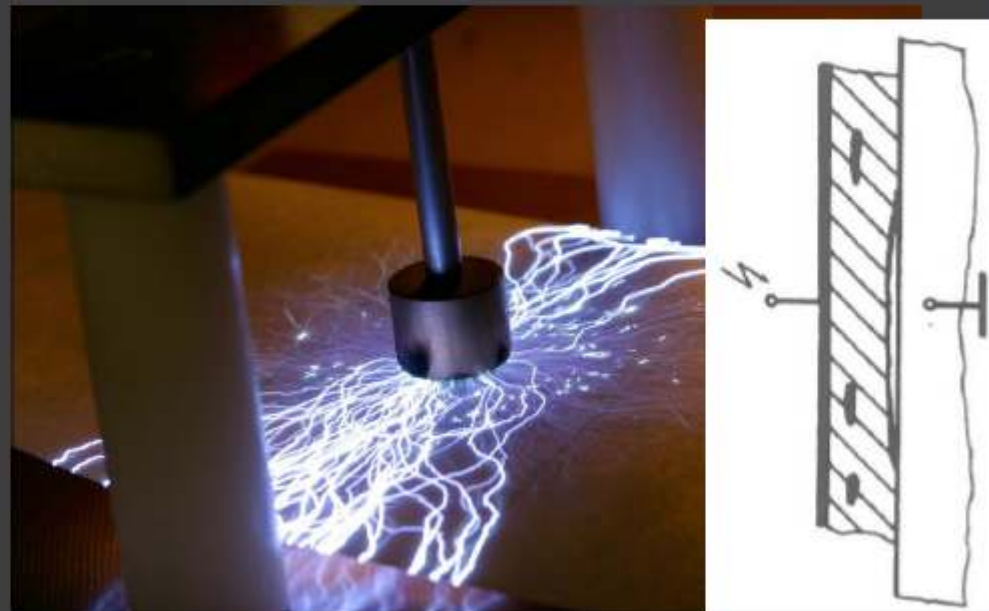
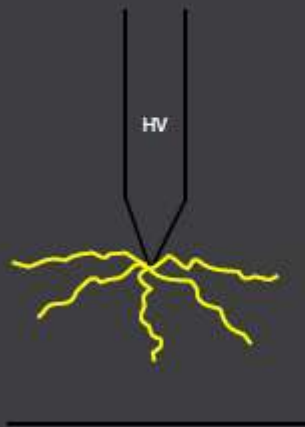


PARTIAL DISCHARGES

Partial discharges

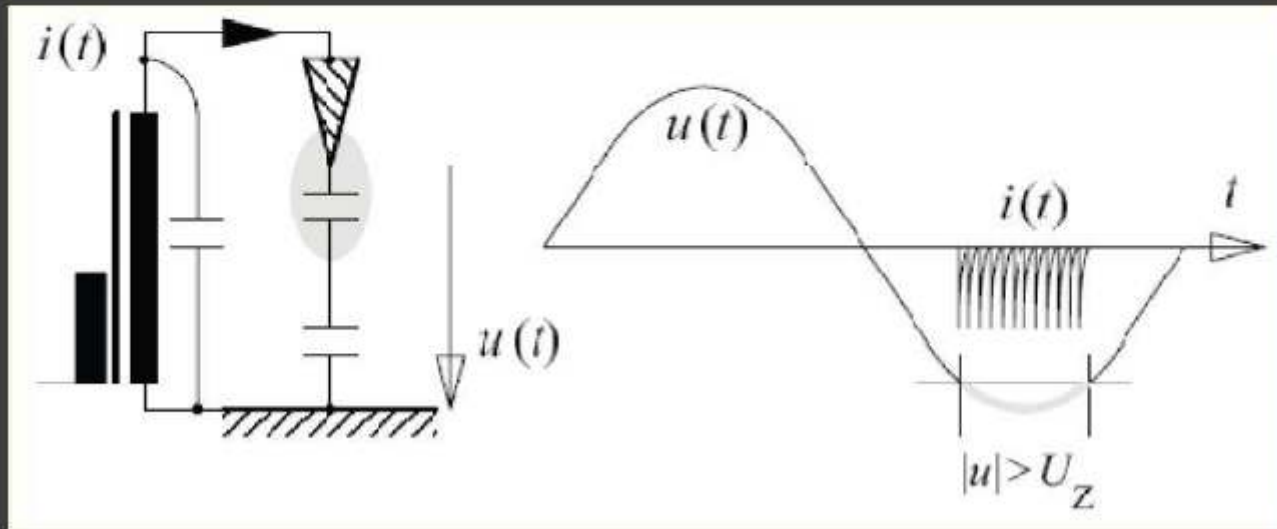
External gas discharges in inhomogeneous electric fields
(not causing immediate breakdown or flashover)



PARTIAL DISCHARGES

Partial discharges

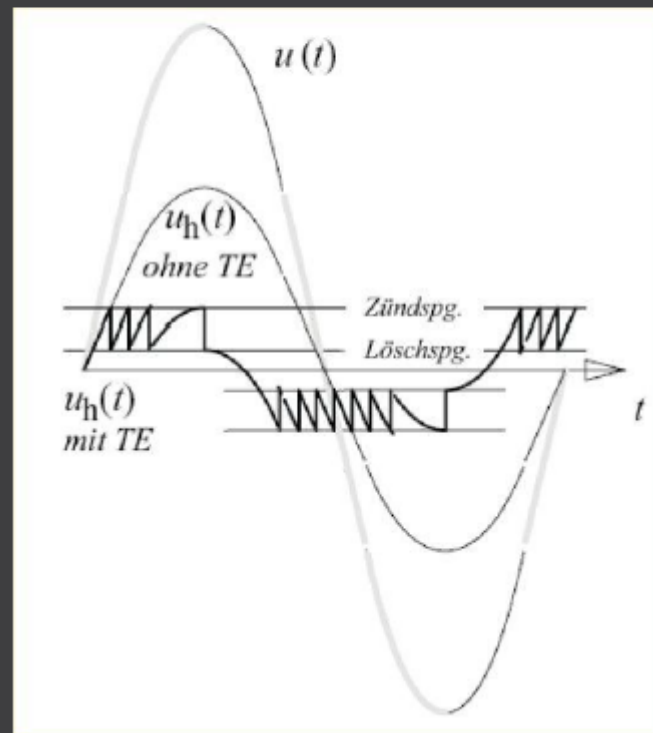
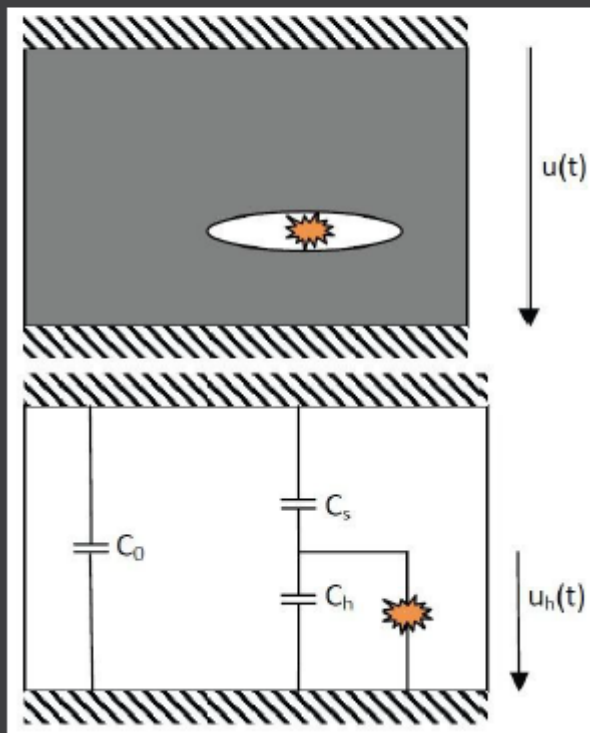
Outer partial discharges



PARTIAL DISCHARGES

Partial discharges

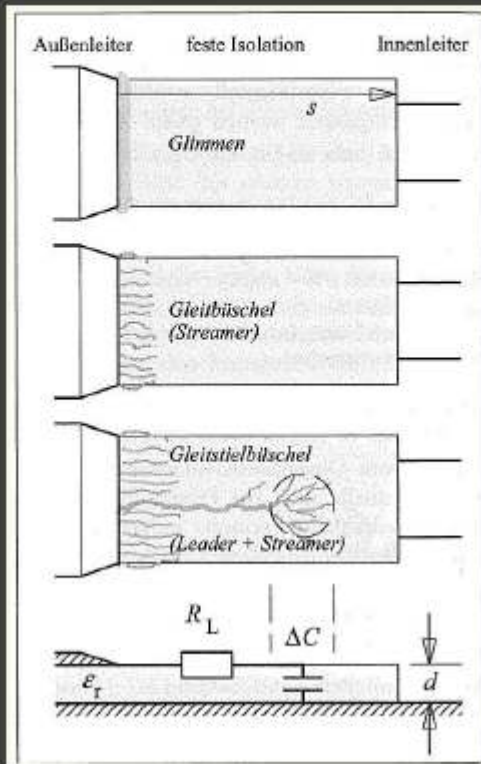
Inner partial discharges



PARTIAL DISCHARGES

Partial discharges

Partial Discharge along boundary surface



PARTIAL DISCHARGES

Partial discharges

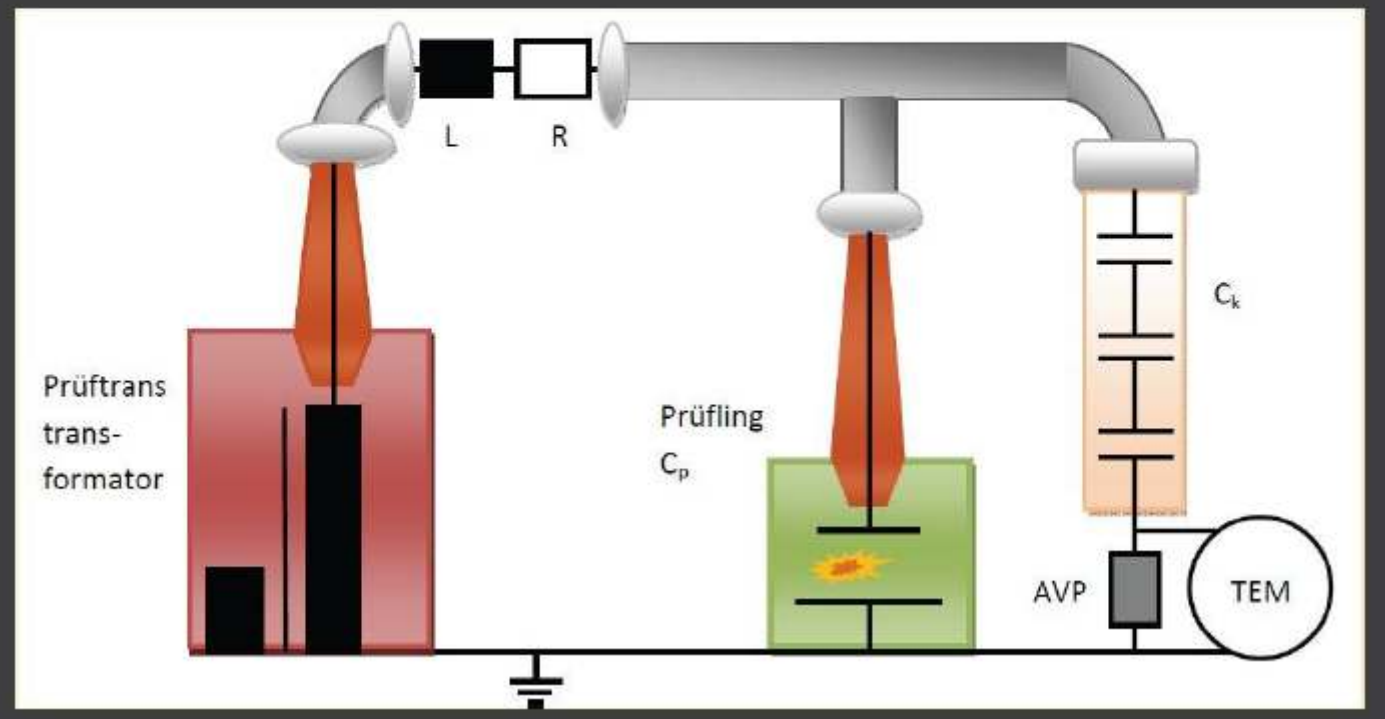
Effects of partial discharges:

- Local thermal hot-spots
- Local increased pressure -> mechanical tension
- Chemical influence, ozone O_3 , nitric acid HNO_3
- UV radiation, visible
- Current impulses in the power line -> additional losses
- HF emission, EMC
- Free space charges favor breakdown, ionized air
- Chemical bindings get destroyed, bleaching
- Noise

PARTIAL DISCHARGES

Partial discharges

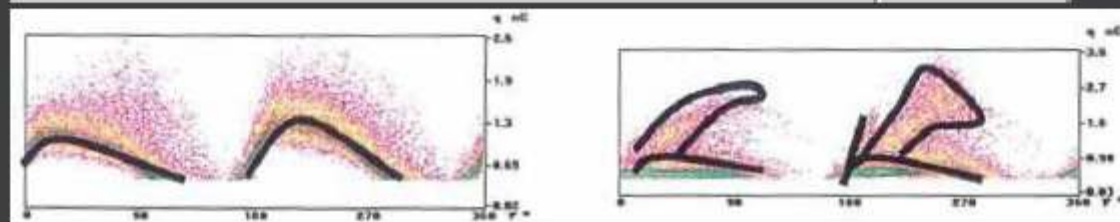
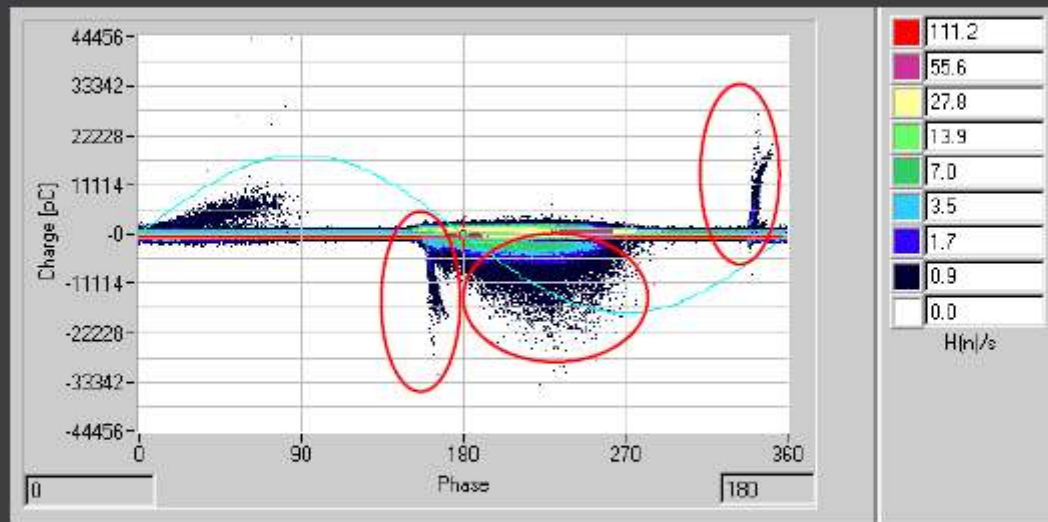
Measurement system:



PARTIAL DISCHARGES

Partial discharges

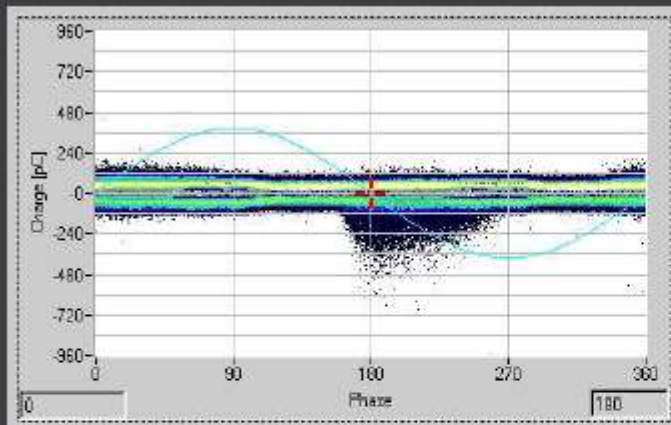
Interpretation: Voids vs. Surface discharges



PARTIAL DISCHARGES

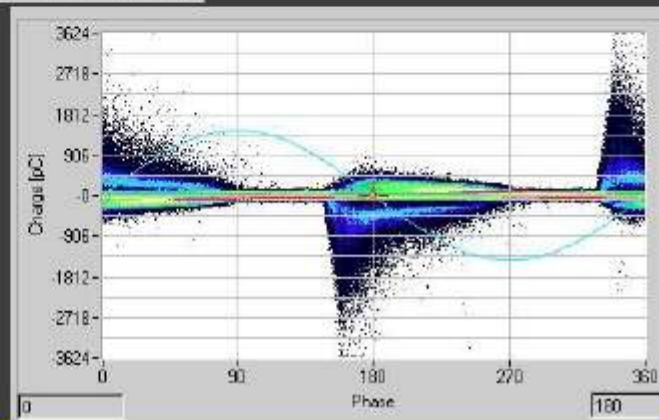
Partial discharges

Interpretation: Ageing



Bar after Curing

Bar after several thermal cycles

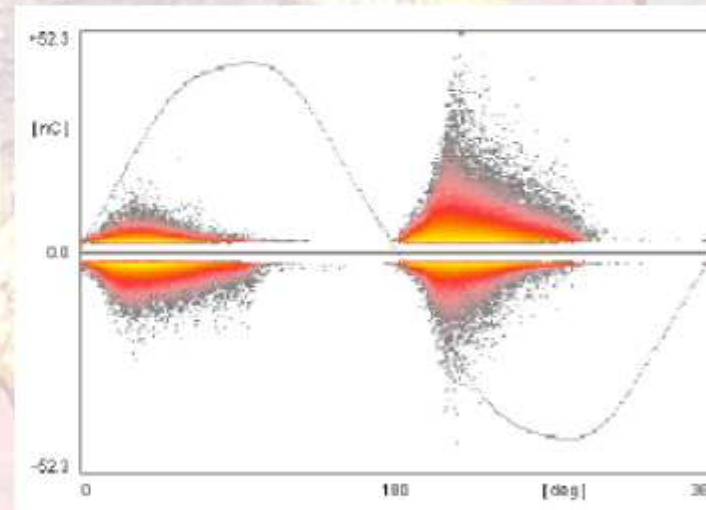


PARTIAL DISCHARGES

Predictive measurements

What can we measure on HV machines ?

- AC Measurements on the stator
 - Partial Discharge Diagnostics



Erosion of the semi-conductor and insulation of the coil

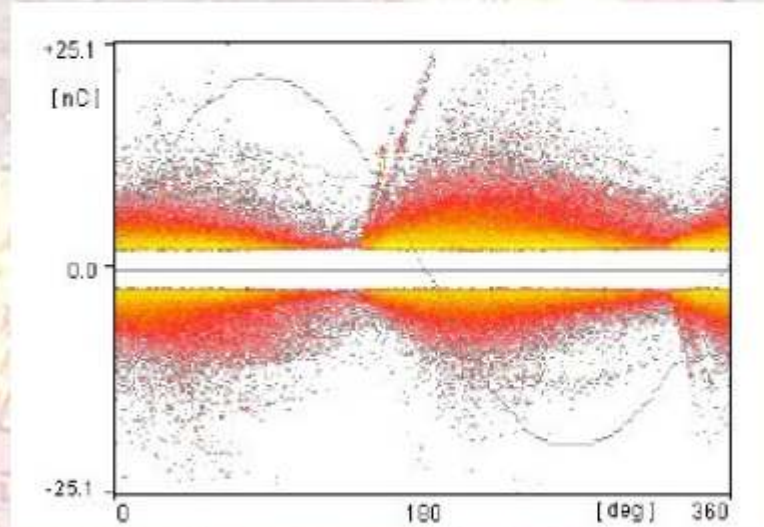
PARTIAL DISCHARGES

Predictive measurements

What can we measure on HV machines ?

AC Measurements on the stator

- Partial Discharge Diagnostics



Not enough space between coils