

# High Voltage Partial Discharge in Power Generators and Power Transformers

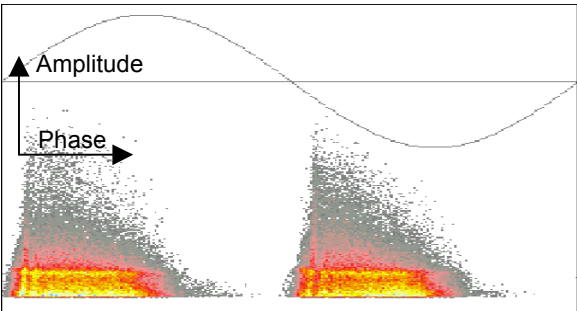
## Partial Discharge Patterns

The core data acquisition procedure is based on an event recording concept, the so-called phase resolving partial discharge analyzer (PRPDA). The PRPDA acquires three-dimensional distribution functions with the coordinates phase angle of high voltage, partial discharge pulse amplitude and event number. These are represented as "color pictures" or fingerprints. wherein color (or gray-scale) represents the pulse repetition rate.

The appearance and characteristics of partial discharge patterns relate to specific defects within the test object. These patterns can either be treated numerically or in complex cases visually by a trained user. Standard partial discharge characteristics, such as discharge current and magnitude are subsets of the 3-D distribution function revealed by a digital instrumentation.

### Rotating Machines: Symmetric Patterns

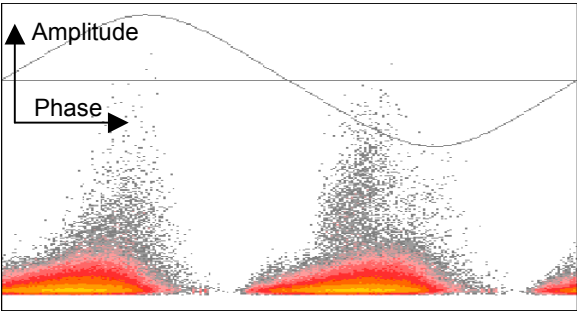
As a result of discharge activity within layers of thermally deteriorated insulation, triangular pattern with highest slope near voltage zeroes are detected



Symmetric Pattern

### Rotating Machines: Surface Discharge Activity

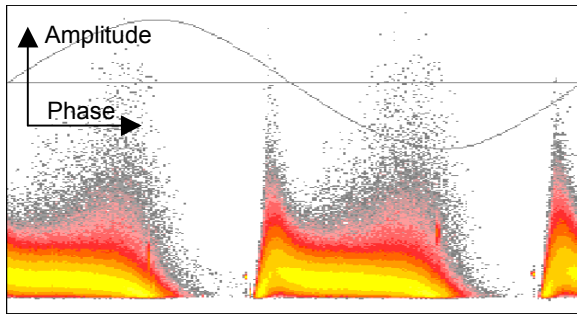
A deficiency of field grading materials and their contamination results in partial discharge in the end-winding region.



End-winding Discharge

### Superimposing of Internal and Surface Discharge

During high voltage testing and on-line partial discharge measurements, internal discharges (in the slot region) and discharges in the end-winding section commonly occur at the same time.



Data supplied by PD-TEC, Switzerland

Pattern Superimposed