TECHIMP SpA
Italy

TECHIMP **INSULATION POLLUTION** CASE STUDIES

LIST OF CASE STUDIES

- 220kV Glass Insulator– PD Monitoring System

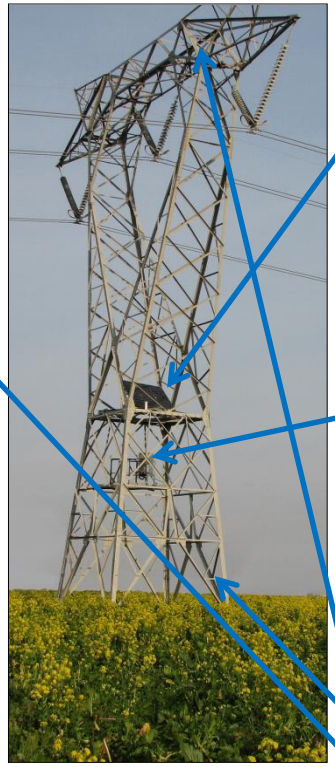
TECHIMP SpA

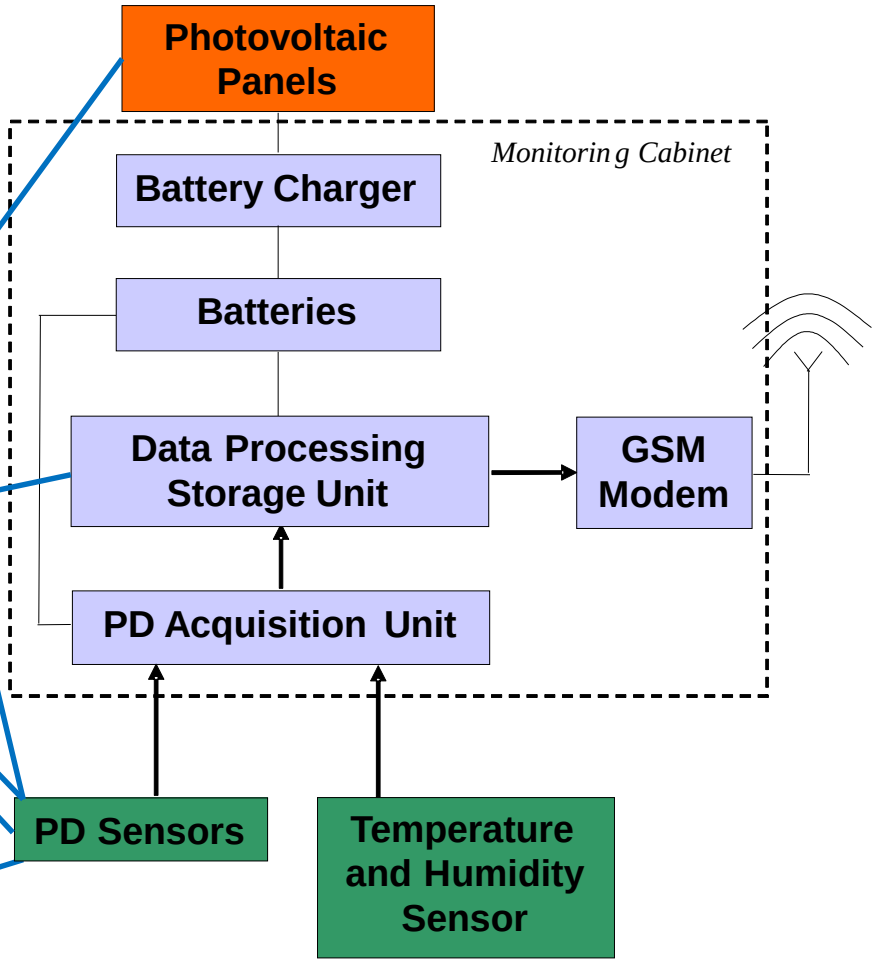
LOCATION	**EUROPE**
EUT	**HV OVERHEAD LINE**
RATED VOLTAGE	**220 kV**
INSULATION	**GLASS**
LENGTH	
VINTAGE	
TYPE OF TEST	**ON-LINE**

CASE STUDY

On-line PD detected inside the stress cone of one HV Termination.

PD measurement setup





PD measurement setup

Tower A
- Insulators treated with silicon paints

Tower B
- Untreated insulators

- Monitoring carried out though PD detectors installed on overhead line insulators (powered by photovoltaic panels)
- PD detected through HFCT clamped around grounding leads and insulator bases
- Electrical field sensor for synchronization purpose
- Monitoring systems supervised and controlled through GSM modem

PD measurement setup

By monitoring PD activity it is possible to derive information about insulator surface pollution level. Therefore, the right moment for insulator washing can be determined, thus allowing the utility to switch from TBM to Condition Base Maintenance (CBM) procedures

The overhead line Partial Discharge Pollution Assessment System (PD_{PAS}) is the ultimate solution for modern utilities.

We can offer two different versions of the tool:

- A portable instrument (battery supplied) which is ideal for single shot measurements;

- A permanently mounted stand-alone system for permanent or prolonged monitoring sessions (see picture).

Main features

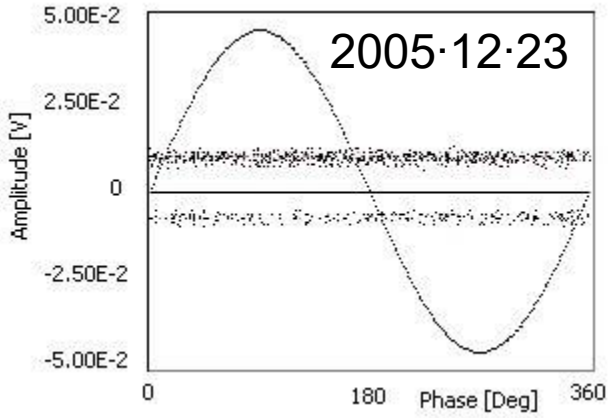
- ✓ Digital partial discharge monitoring
- ✓ PD pulse analysis
- ✓ Fuzzy logic tools and statistical processing or automatic identification
- ✓ Diagnostic Database
- ✓ Trend of environmental parameters to be correlated with PD activity
- ✓ Fully stand-alone
- ✓ Remote controlled via GSM
- ✓ Automatic alert

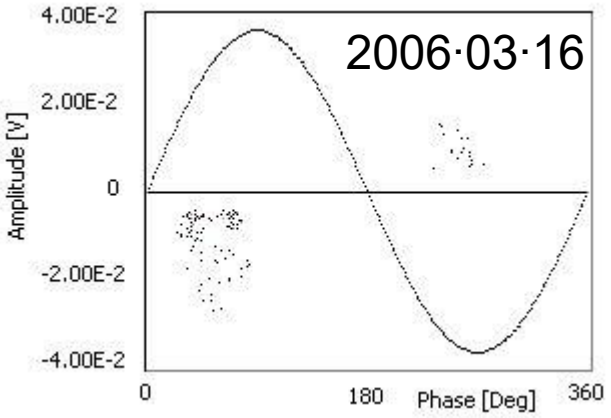
PD measurement results

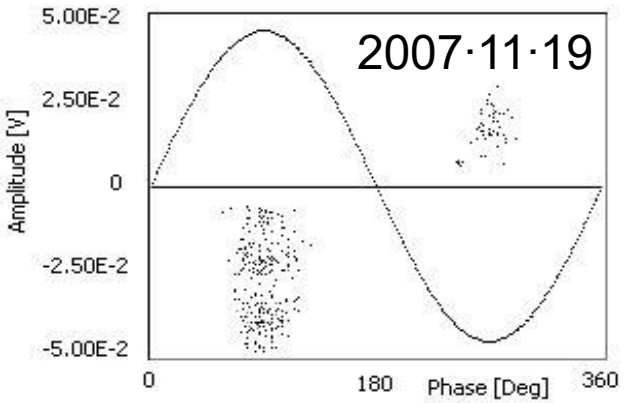
- Initial time (PD monitoring system installed after insulator washing). PD pattern and intensity comparable for the 2 towers (very low)
- After 24 months, on insulators B typical phenomena associated with polluted insulators
- After 24 months, on insulators A similar phenomena but much lower intensity and rate

PD measurement results

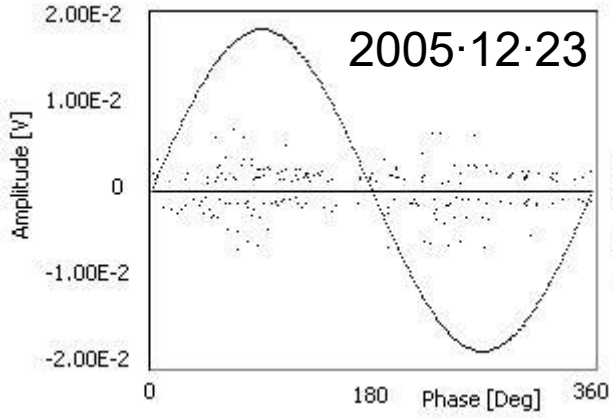
Tower A

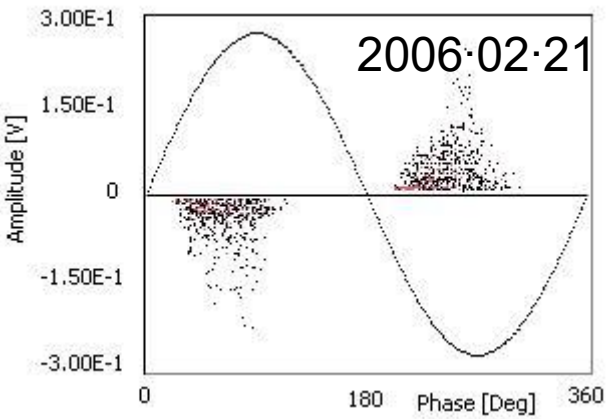


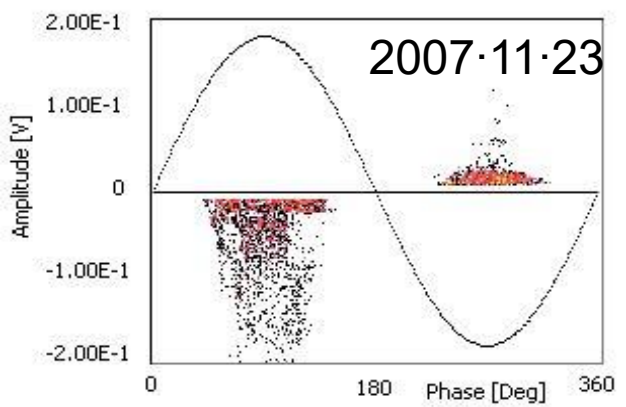




Tower B

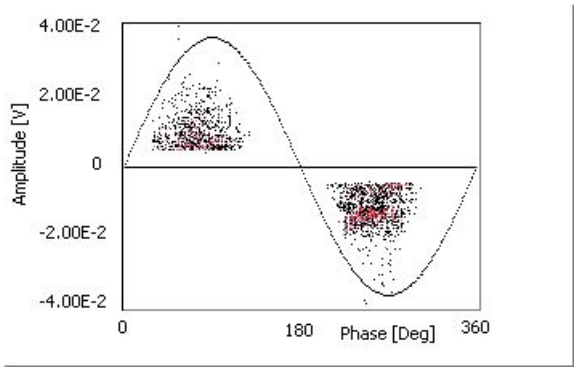


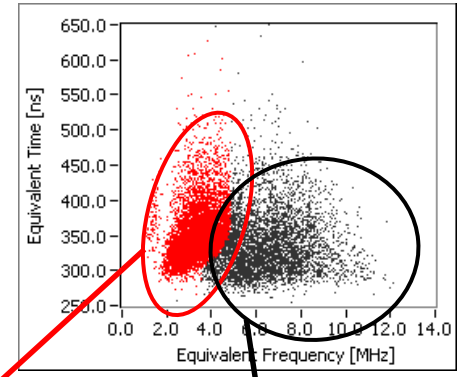




PD measurement results

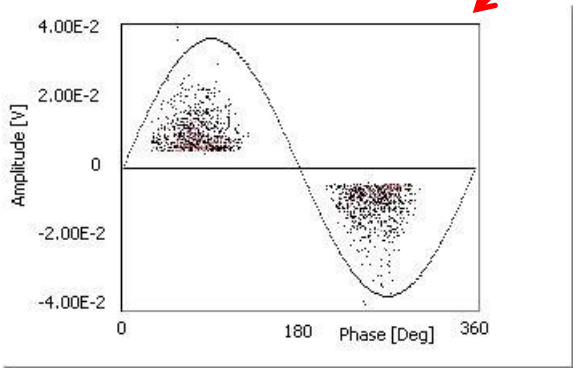
Tower B





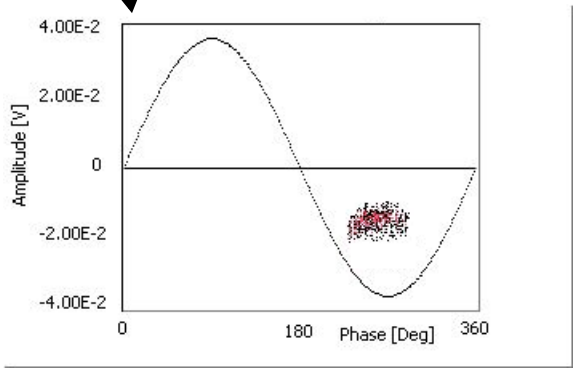
Surface phenomena due to insulator pollution

Amplitude	35 mV
Beta	2,25
Skewness	1,68



Corona phenomena (related to weather conditions)

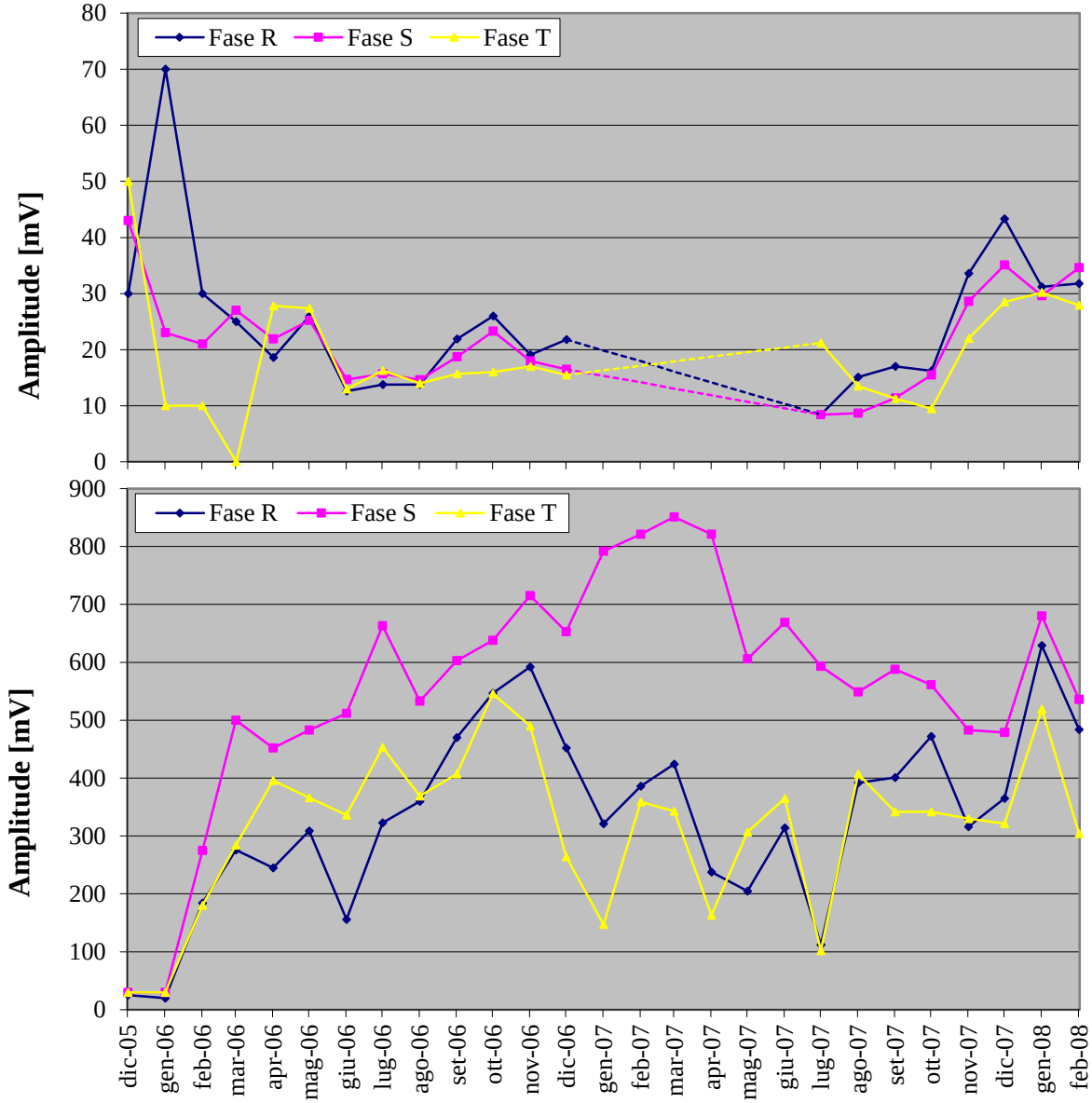
Amplitude	23 mV
Beta	7,2
Skewness	0,16



Comparable amplitude, amplitude dispersion very different!

Separation between corona and surface discharges due to pollution: the system is not affected by false warnings due to corona.

PD measurement results

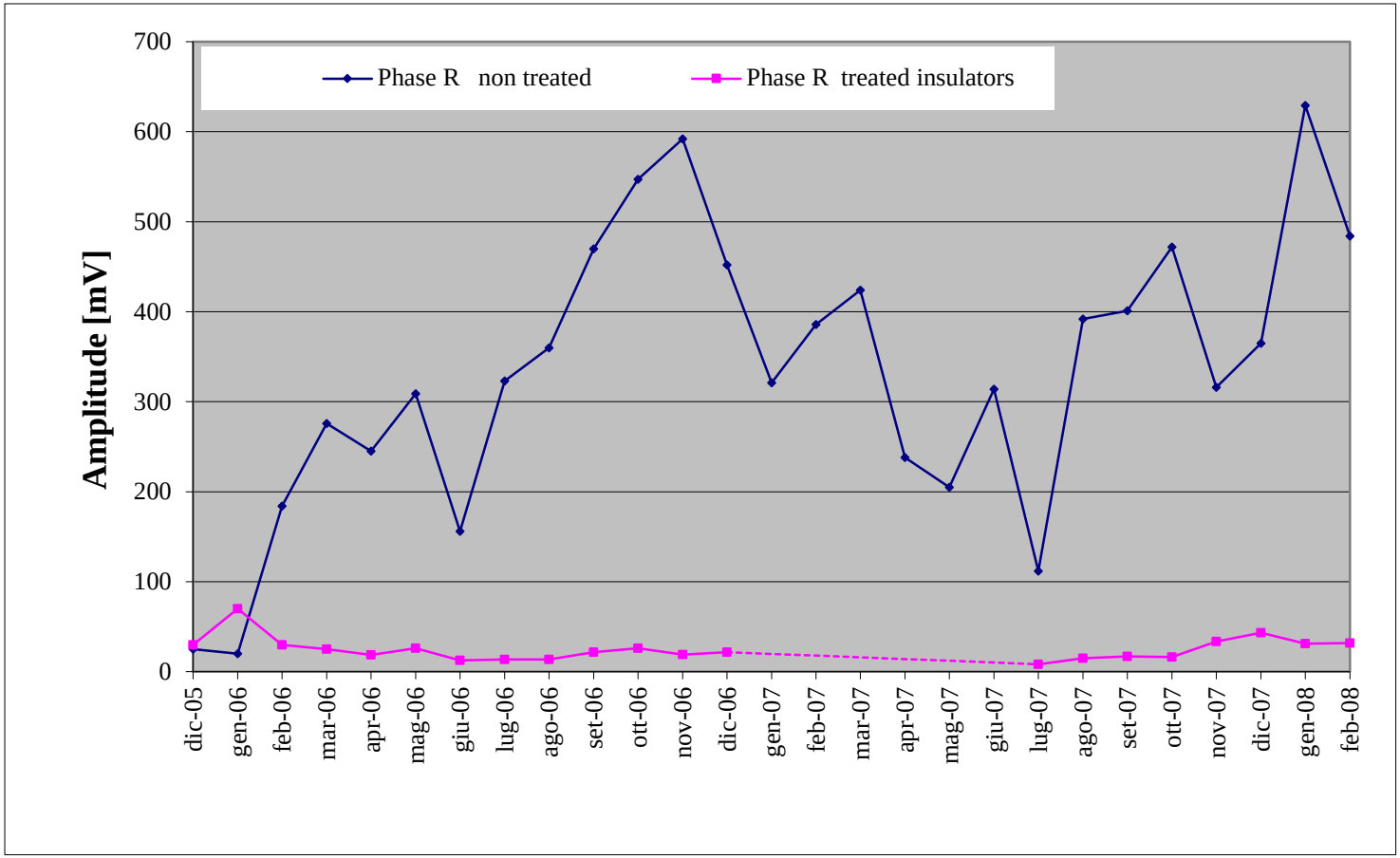


Treated insulators

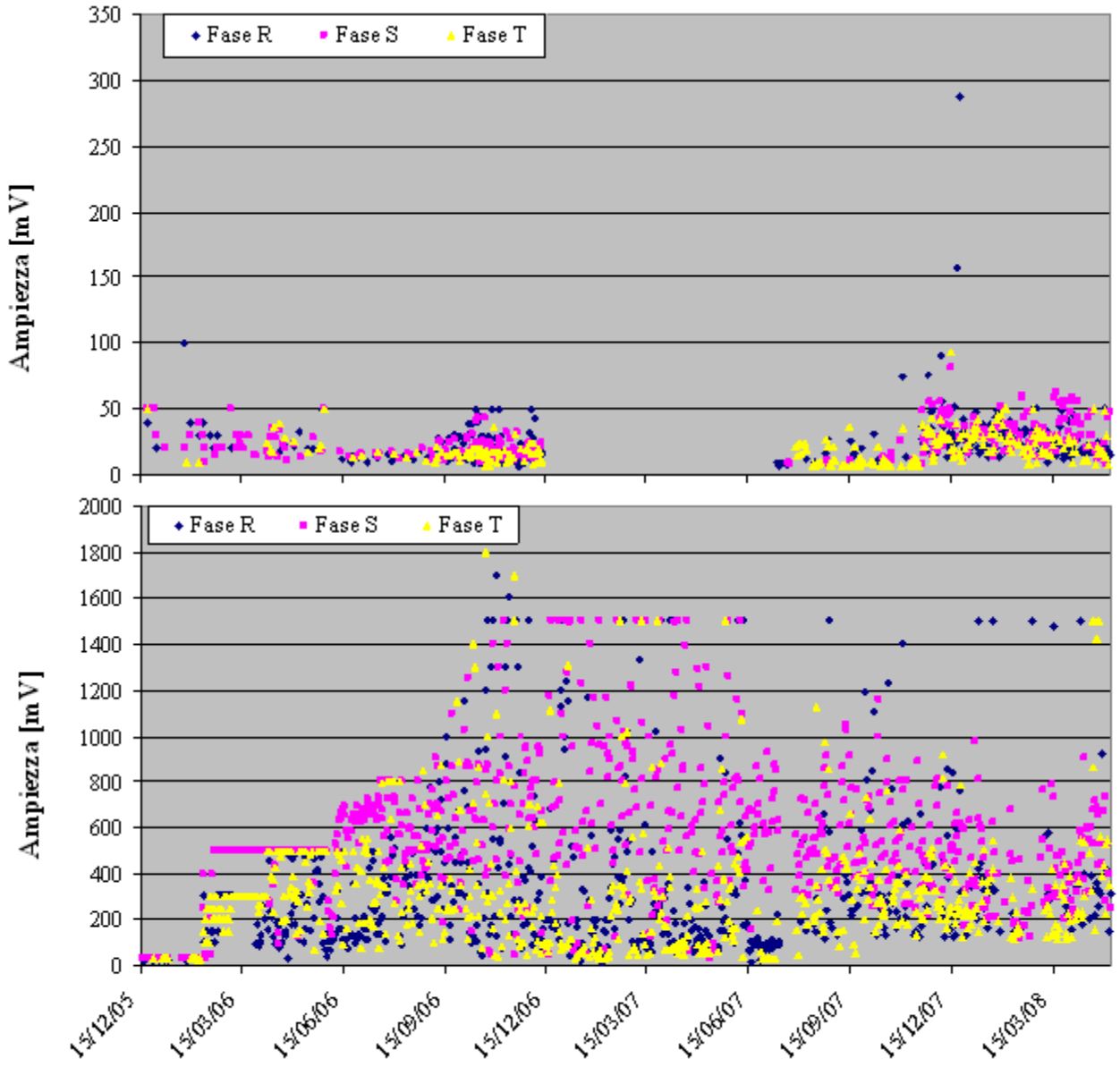
Non-treated insulators

PD measurement results

Comparison data between treated an non-treated insulators



PD measurement results



Treated insulators

Non-treated insulators