



TC-EM Highlights

Luca Callegaro

Madrid and Tres Cantos, Spain
15 – 18 May 2017



Technical Committee for Electricity and Magnetism



32 Contact Persons **≈2100 CMCs (≈800 matrices)**

4 SubCommittees
SC-DC and Quantum Metrology
SC-Low Frequency
SC-RadioFrequency and Microwave
SC-Power and Energy

1 Working Group on Strategic Planning

1 Comparison Task Force

n Meetings
1/yr TC-EM
1/yr all SCs (formal: **april-june 2017**, or informal)
1/yr EMPIR Call
+ scientific events



**Electricity and
Magnetism**

EMPIR Projects



Final Dissemination Workshop of EMPIR 2013 **Energy** Projects!

Combined:
SmartGrid-II
FutureGrid
GridSens
19, 20 April 2017

+ MeSAIL



ENG 52 SmartGrid II

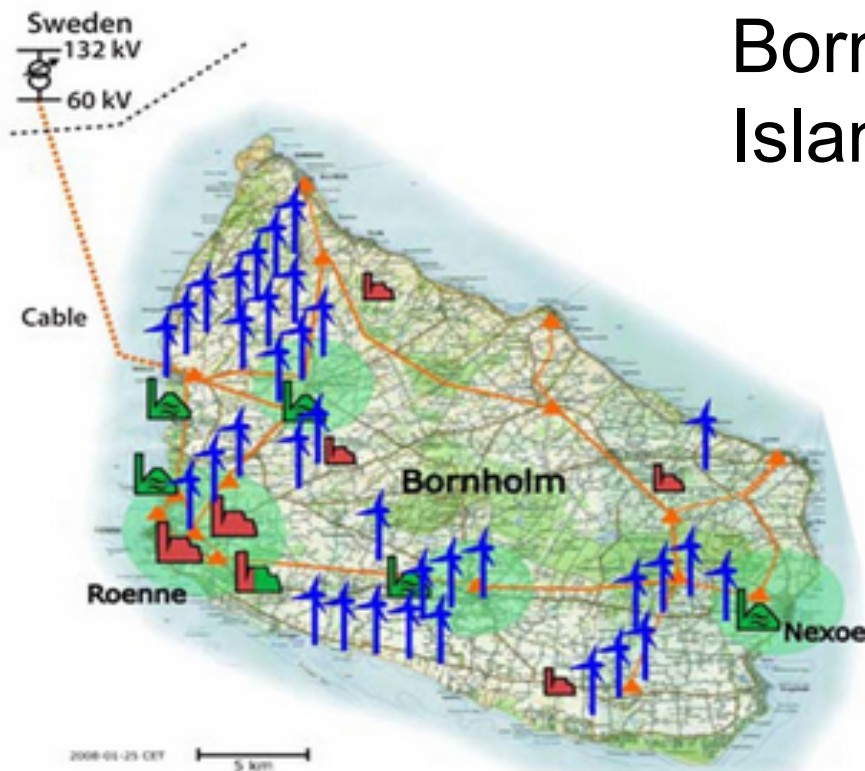
Measurement tools for Smart Grid stability and quality



Main objective:

to develop, demonstrate and validate new measurement tools for network operational stability and power quality

Real test sites, including Bornholm Island



Bornholm Island

28 000 Customers

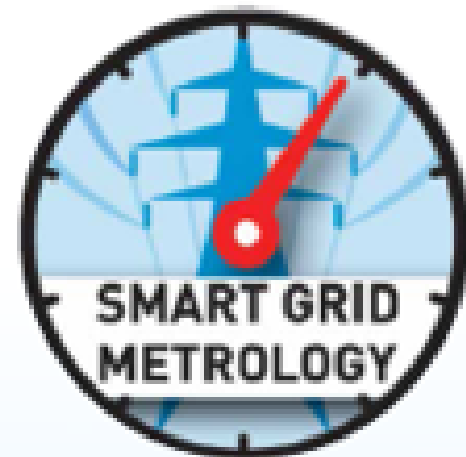
Wind Power 36 MW

CHP (biomass) 16 MW

PV 2 MW

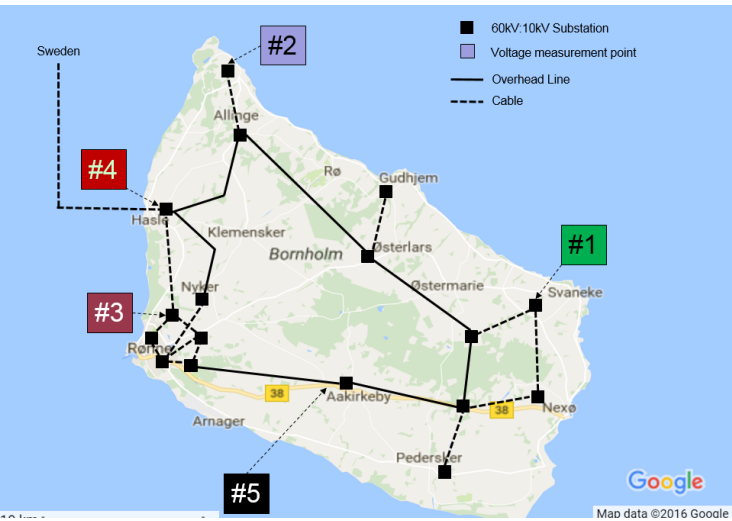
Biogas Plant 2 MW

5 District Heating Plants

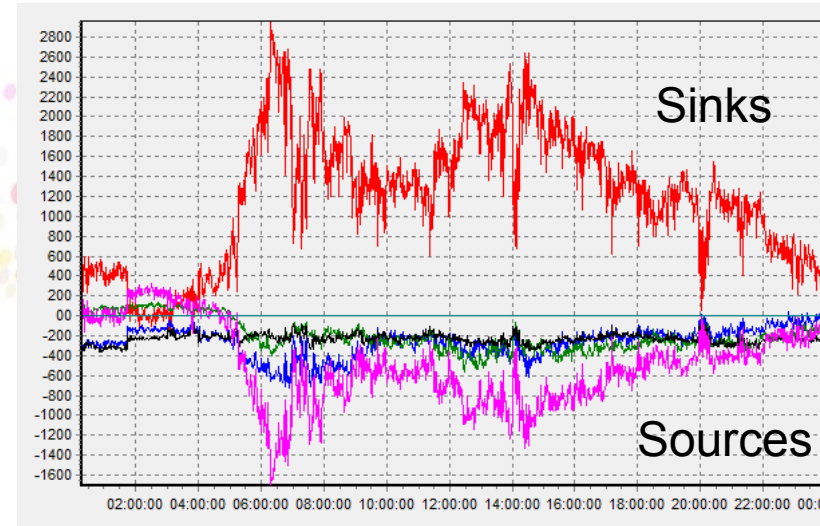


ENG 52 SmartGrid II

Measurement tools for Smart Grid stability and quality



Sources
& sinks of
harmonics



Seven Channel Wireless Digitizer Provisional Overview

A portable high precision GPS Synchronised Power Analyser for laboratory and on-site electrical measurements. Designed for high granularity three phase power and power quality measurements at the 0.01% level. Ideal for use in wide-area measurements when utilising multiple synchronised instruments.

ENG 52 SmartGrid II

Measurement tools for Smart Grid stability and quality



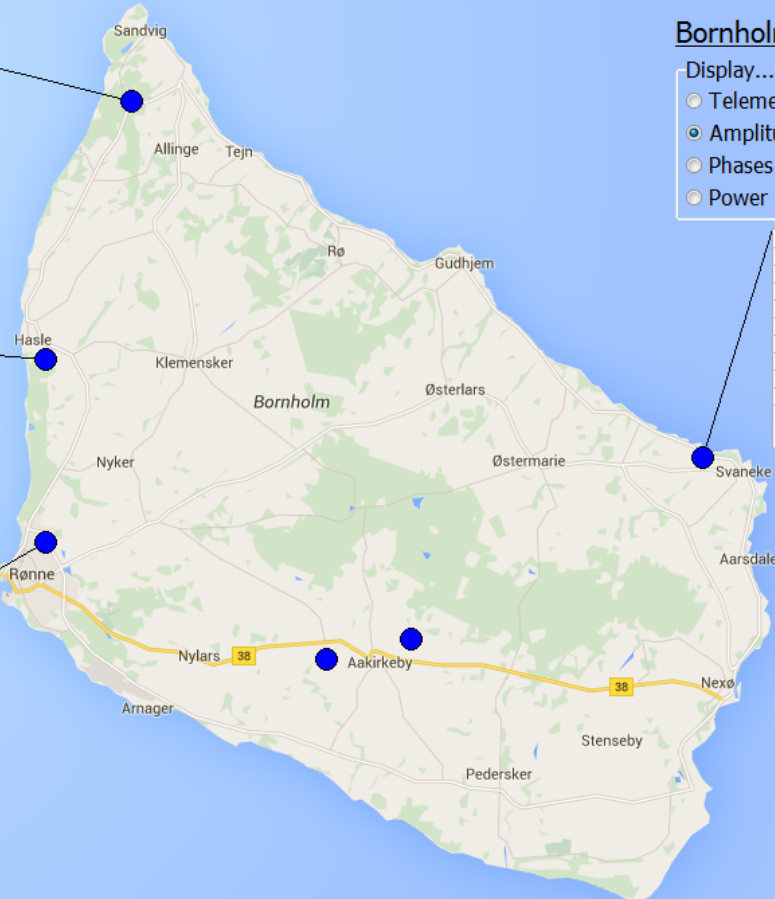
SmartPQ Data Concentrator

Upload SmartPQ files Consolidation of Sites Status of SPQs Map

Site	SPQ205
Date	18/05/2016
Time (UTC)	12:28:00
V1	234.6343
V2	234.6681
V3	234.8508
I1	63.067
I2	67.330
I3	74.092
N	35.5093

Site	SPQ204
Date	18/05/2016
Time (UTC)	12:28:00
V1	35873.61
V2	36644.52
V3	35724.63
I1	192.4516
I2	189.5945
I3	186.7126
N	0.000000

Site	SPQ207
Date	18/05/2016
Time (UTC)	12:28:00
V1	231.2518
V2	231.3116
V3	27.8191
I1	95.567
I2	81.722
I3	999.900
N	1



Bornholm Island

Display...

- ☐ Telemetry
- ☒ Amplitudes
- ☐ Phases
- ☐ Power

Site	SPQ203
Date	18/05/2016
Time (UTC)	12:28:00
V1	229.2582
V2	228.6608
V3	229.5606
I1	64.406
I2	75.500
I3	59.736
N	2.9168

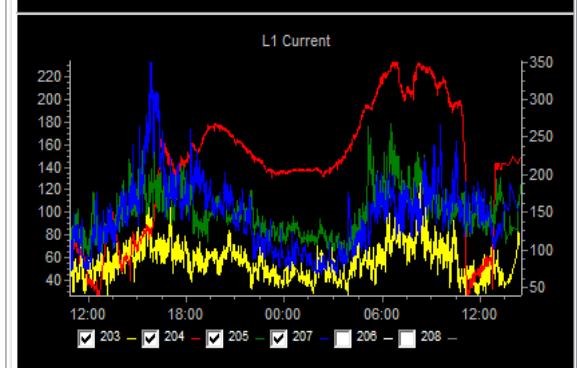
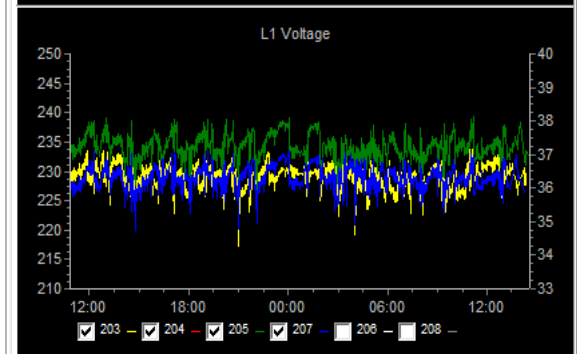
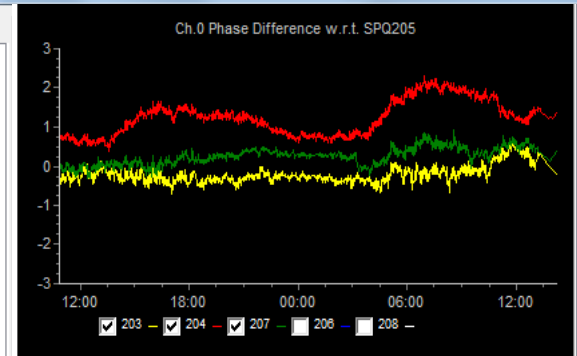
Update Status

Last Update 18/05/2016 13:28:26

☒ Auto Update after the following minutes

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Clear Plots



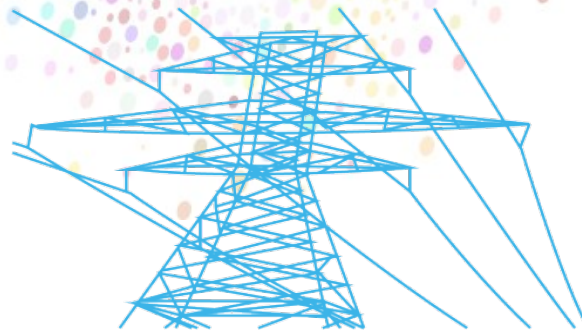
ENG 61 FutureGrid

Non-conventional sensors for future power grid



- Next generation **optical** current sensors
- Next generation conventional voltage and current sensors
- Sensor metrology

3

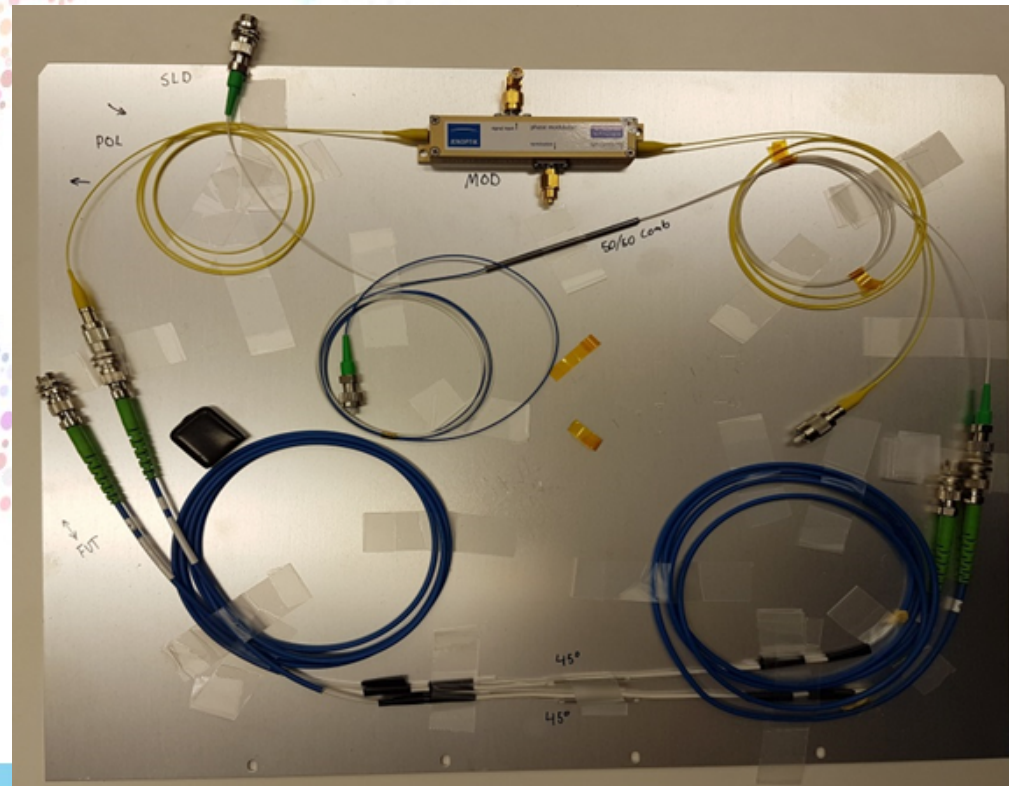
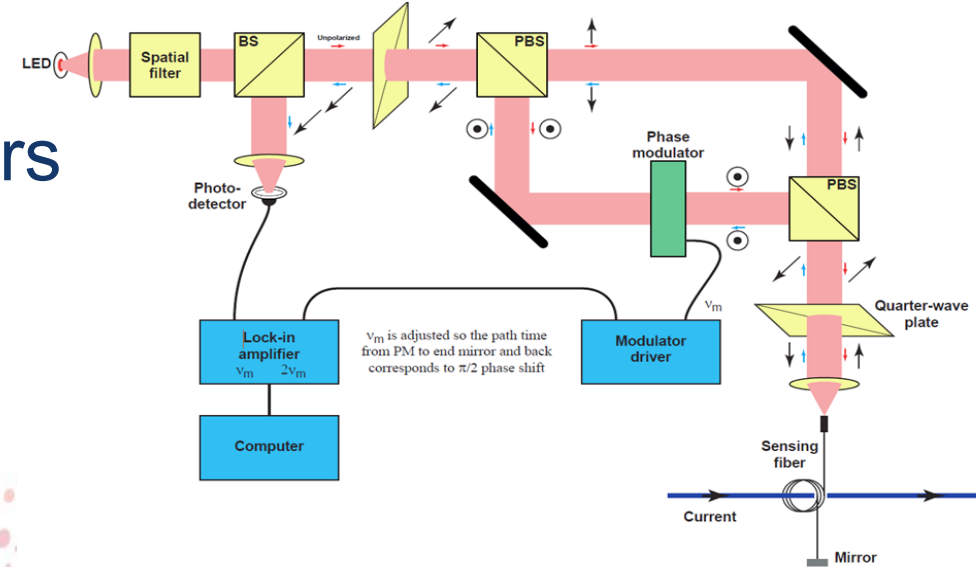
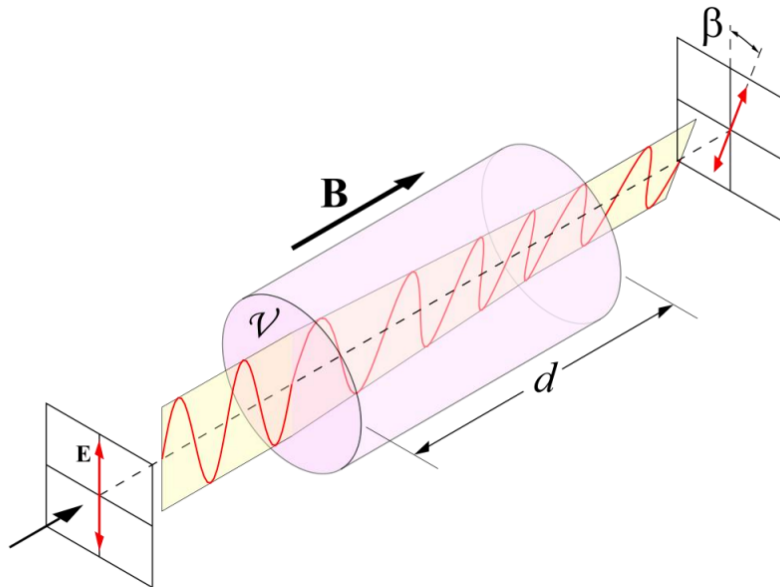


Future
GRID

ENG 61 FutureGrid

Non-conventional sensors for future power grid

Optical current sensors



ENG 61 FutureGrid

Non-conventional sensors for future power grid



50 kV, 5 kA, 10 kHz combined wideband current+voltage sensor



Main objectives:

Sensor network metrology algorithms to process data from real grid monitoring systems

To determine uncertain **distribution network topologies** and **line impedances** and verify existing grid models using **on-site measurements**

Phasor Measurement Units (PMUs)
for **power flow calculation**
and state estimation

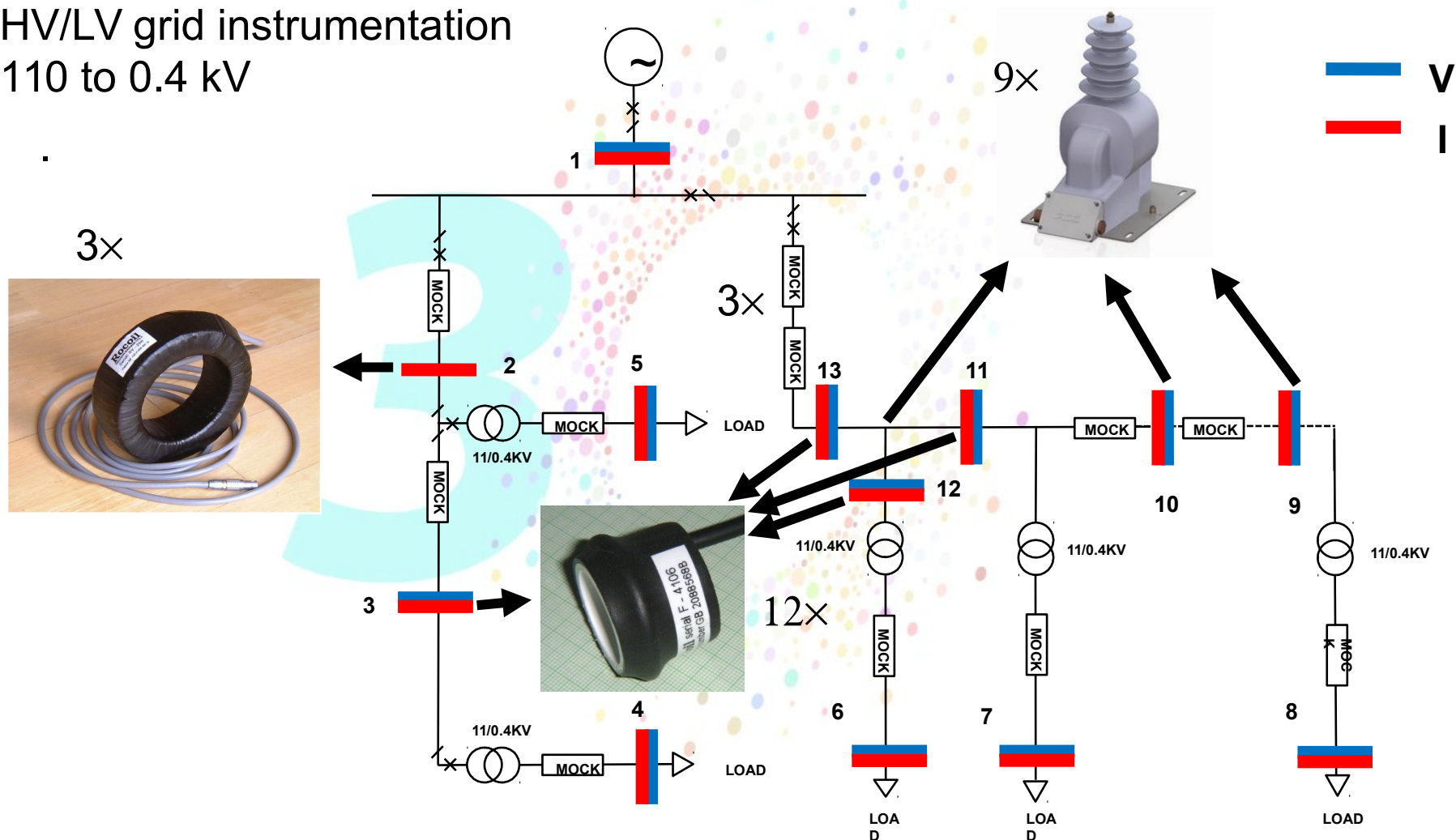


ENG63 GridSens

Sensor network metrology for the determination of electrical grid characteristics



HV/LV grid instrumentation
110 to 0.4 kV



ENG62 MESaIL, Metrology for Efficient and Safe Innovative Lighting



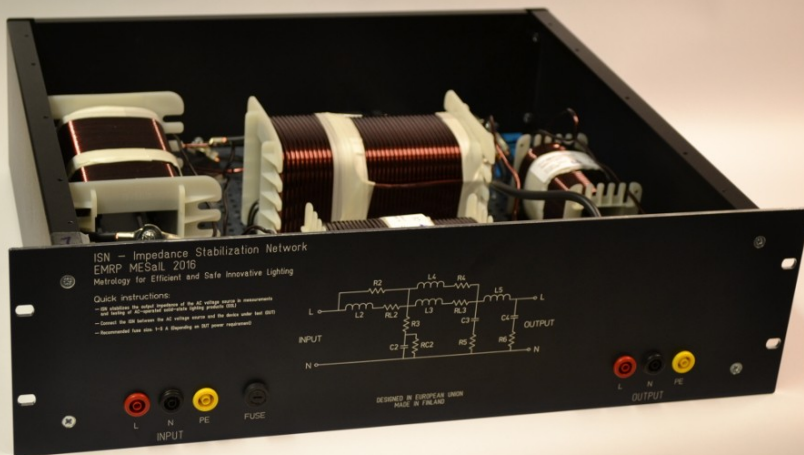
New lamps: **electrical power quality** issues!

High-frequency components in voltage and current waveforms

Power supply properties influence the lamp working point


Prototype:
Impedance stabilization network

Prototype:
SSL electrical simulator



Comparison Toolbox: real comparisons being managed now





Welcome,
Luca Callegaro

- Home
- User Profile
- My Comparisons
- Messages
- Information
- Logout

Comparison Details : EURAMET EM-S42

[Calendar](#)[Main Data](#)[Pilot/Support](#)[Packing List](#)[Documents](#)[New Measurement](#)[Gallery](#)

Head Data

Name	EM-S42
Description	Comparison of lightning impulse (LI) Reference Measuring Systems
Coordinator(Pilot)	Alf-Peter Elg
Comparison Created	2016-11-24

Measurements

The pilot choose, that your Documents should be uploaded.
* Enter Measurements in the Tab : "New Measurement"

Device information

Main Device	HighVolt SMR 10/700
Serial Number	906915
Alternative Device	MIAS 200-12/2C
Serial Number	907143

Conference on Precision Electromagnetic Measurements, CPEM 2018

Reservation of satellite
meetings / parallel
events: in these days

Call for papers: Jan 2018

5 days of **electromagnetic metrology**, plus:

CCEM WG on the electrical methods to monitor the stability of the kilogram

CCEM WG on RadioFrequency quantities (GT-RF)

SC-Power and Energy experts meeting (informal)

SC-Low Frequency experts meeting (informal)

SC-DC and Quantum Metrology experts meeting (informal)

WGSP meeting devoted to the EMPIR 2019 Call (informal)

CODATA meeting

Chair: Francois Piquemal, LNE



CONFERENCE ON **P**RECISION
ELECTROMAGNETIC **M**EASUREMENTS

July 8 - 13, 2018

PARIS • FRANCE



Thanks!

