NetzImpedanz Interessen Verband

Characterization of the electrical grid as a propagation medium for PLC

Dr. Itziar Angulo - TSR Research Group

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Universidad del País Vasco

Euskal Herriko Unibertsitatea

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Who we are

TSR - Tratamiento de la Señal y Radiocomunicaciones

Signal Processing and Radiocommunication Research Group

Faculty of Engineering in Bilbao

- **University of the Basque Country UPV/EHU, Spain**

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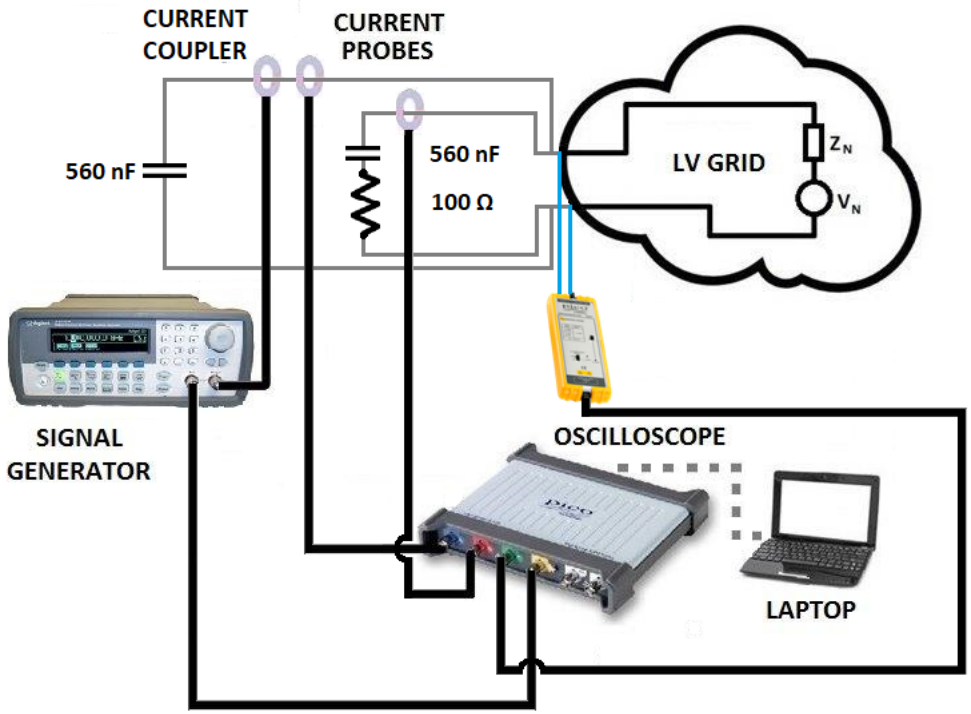
- **Main objectives of our research area**
  - Characterization of the power grid as a propagation medium for PLC (frequencies above 9 kHz)
  - Analysis of efficiency and performance of Power Line Communications and design of new communication technologies for Smart Grids

Previous and ongoing work

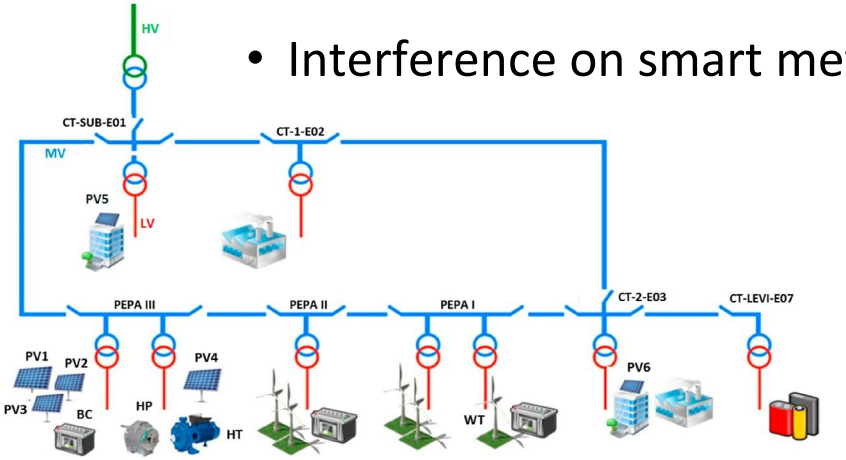
Measurement systems for Non-Intentional Emissions, Grid Access Impedance and Attenuation (9 – 500 kHz)

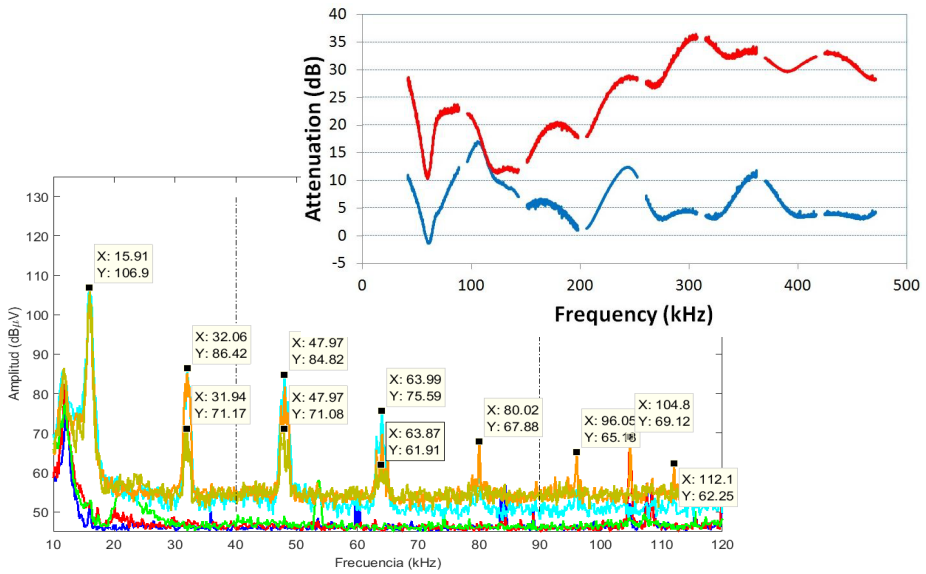


Previous and ongoing work

Study of Non-Intentional Emissions Generated by Distributed Energy Resources and their Influence over Power Line Communications (20 – 500 kHz)

- Characterization of Non-Intentional Emissions from Distributed Energy Resources in a microgrid
- Characterization of the frequency-dependent transmission losses
- Interference on smart metering communications

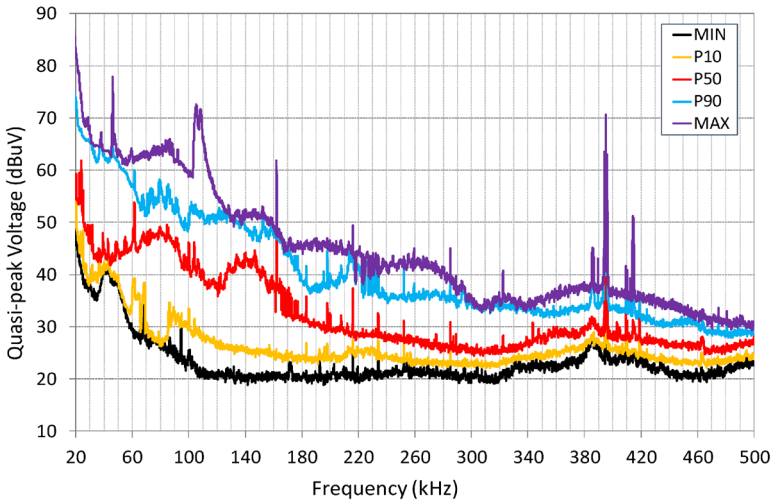




Previous and ongoing work

Field Trials for the Characterization of Non-Intentional Emissions at Low-Voltage Grid (20 – 500 kHz)

- Field trials in urban and rural scenarios
- Identification and characterization of different types of NIE in time and frequency domains



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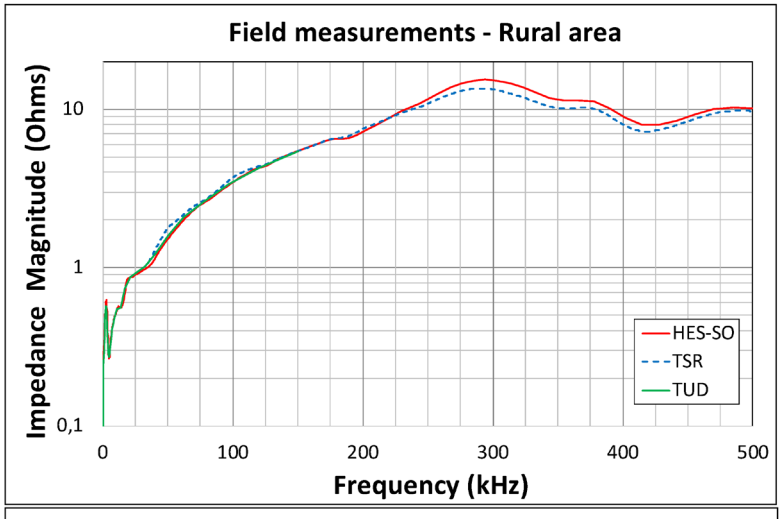
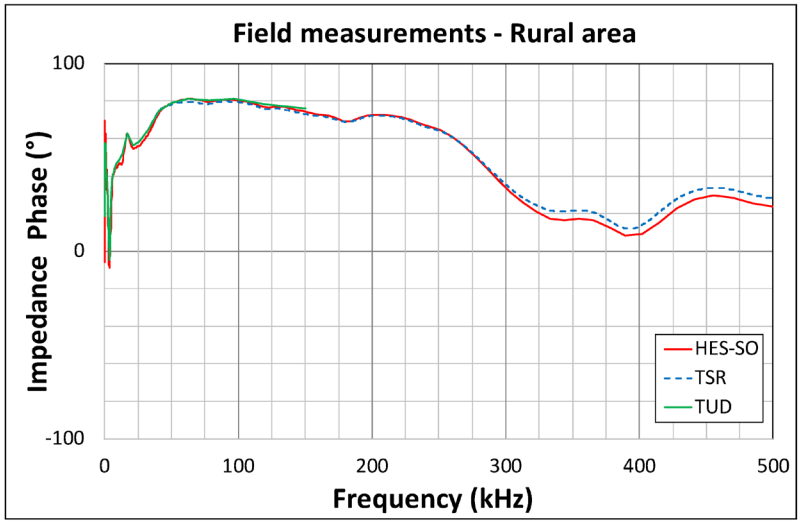
Previous and ongoing work

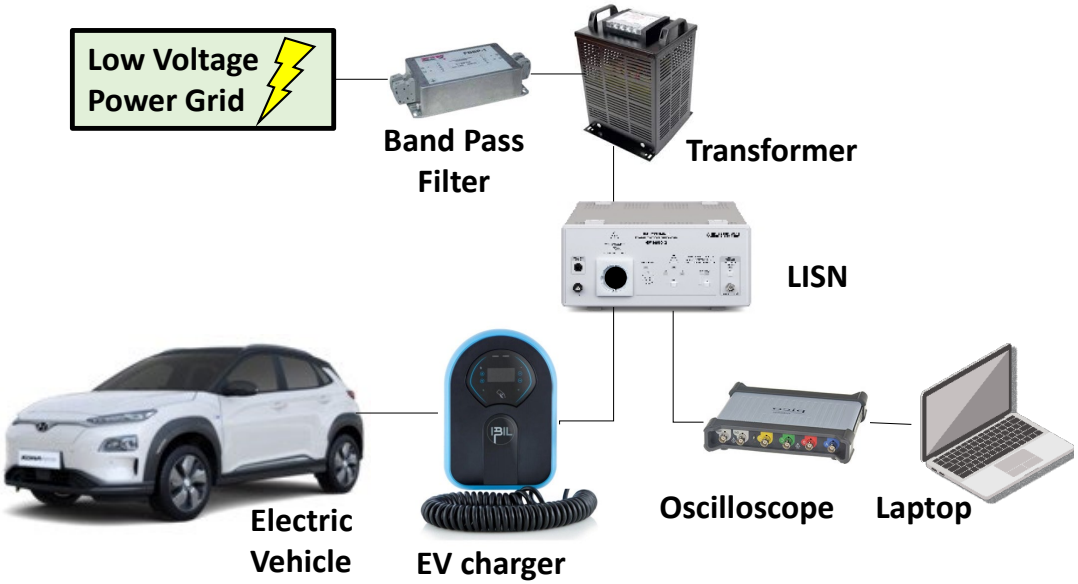
Field Trials for the Characterization of Frequency-dependent Grid Access Impedance at Low-Voltage Grid

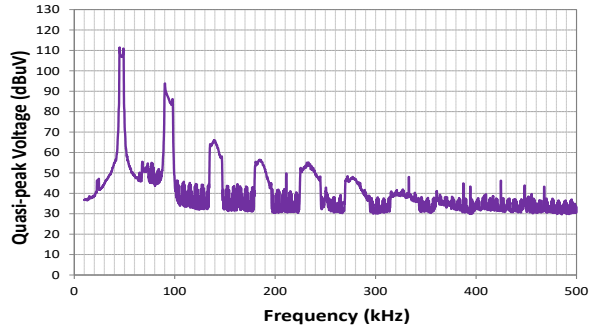


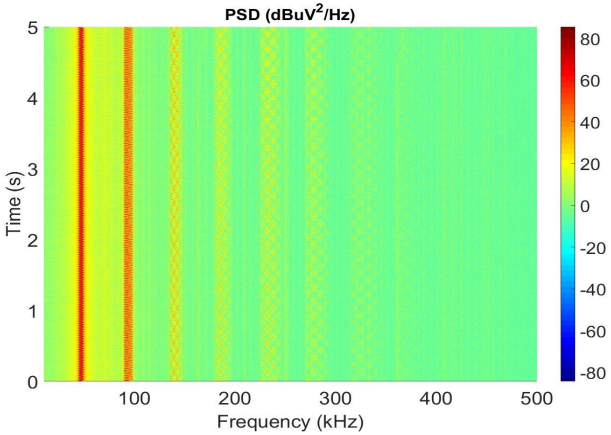


Previous and ongoing work

Characterization of NIE from Electric Vehicles and influence on Power Line Communications







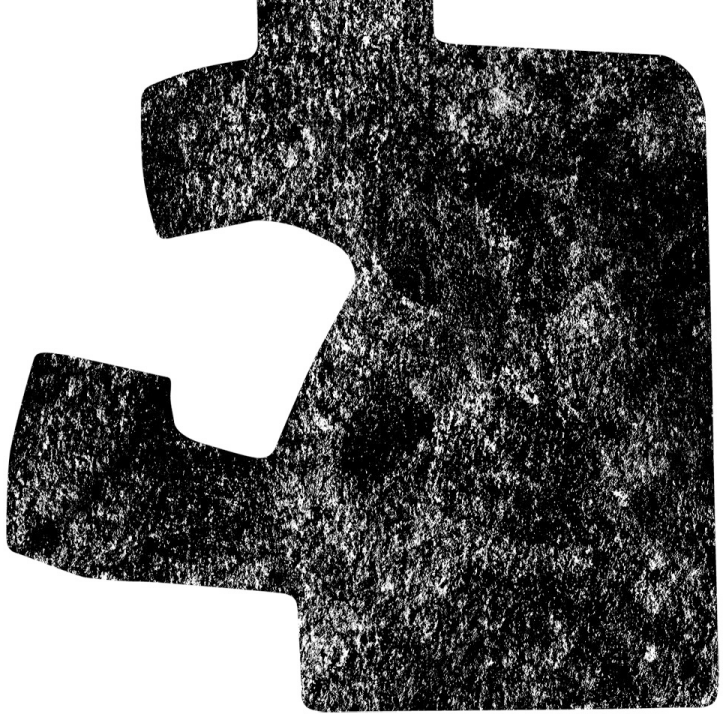
International Committees and Standards Organizations

European Committee for Electrotechnical Standardization (CENELEC) – CLC/TC 217 Mains communicating systems – WG11 Immunity

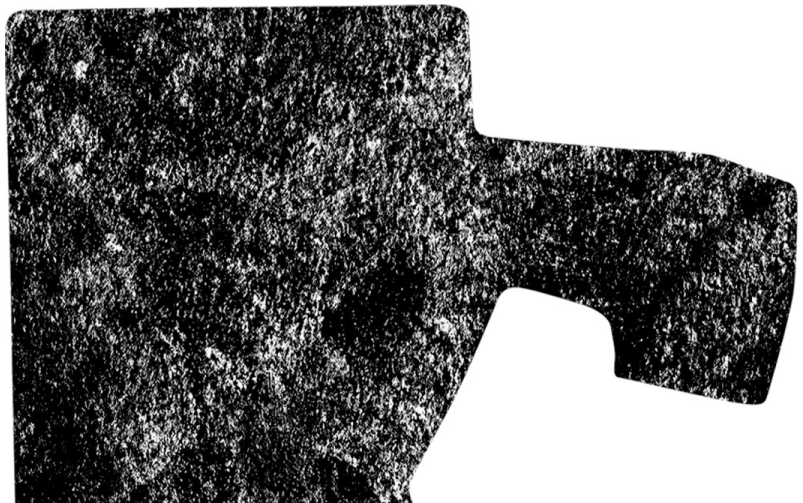
International Electrotechnical Commission (IEC-SC77A/WG 9)

Conseil International des Grandes Réseaux Électriques (CIGRÉ) –

JWG C4.31/CIRED - EMC between communication circuits and power systems



Thank you for your attention



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