URSI - ANACOM

Lisboa 18-11-2016

Study of Interference Phenomenon Between WPT and WIFI 802.11a Signals

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IPL instituto politécnico de leiria

instituto de telecomunicações

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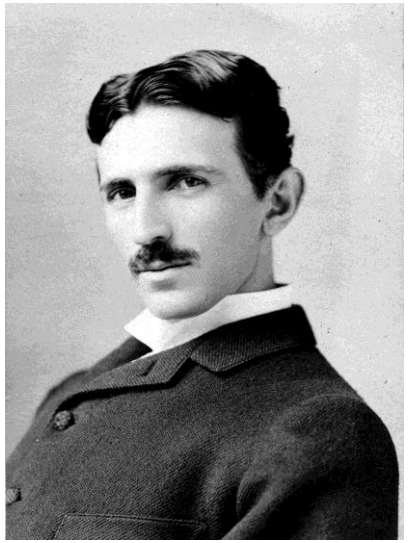
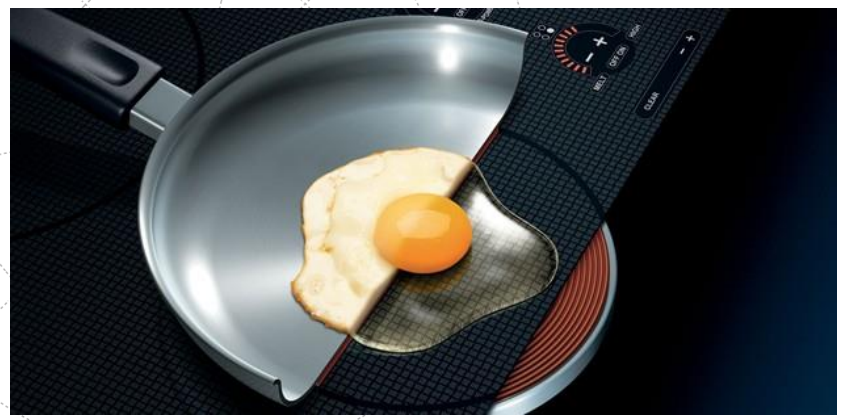
What is WPT?

NIKOLA TESLA

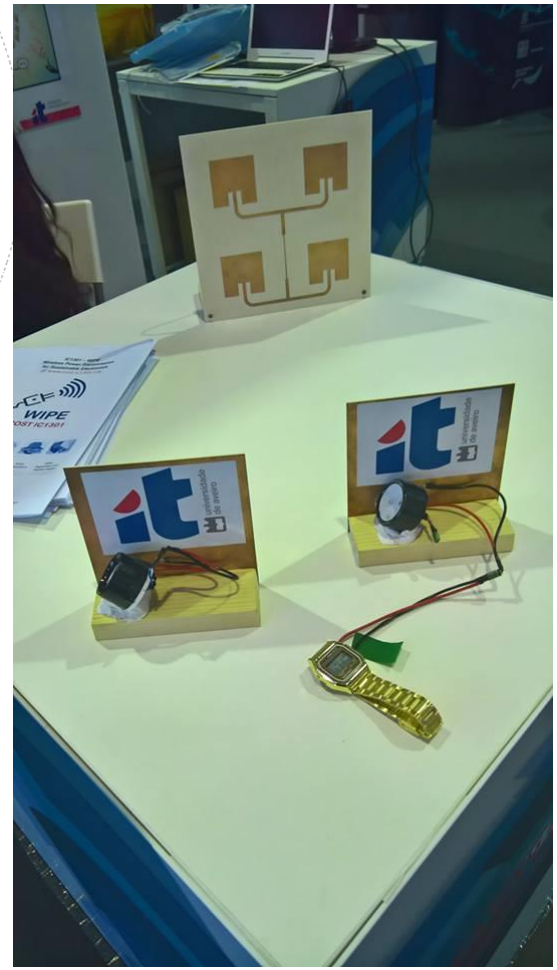
Wardenclyffe Tower (1901 -1917)



INDUCTIVE - WPT



Antennas



http://www.techdays.pt/

What are the advantages?

Advantages – Less Wires

Advantages – Less Batteries

Advantages – A bridge to renewable energy

WPTC – WIRELESS POWER TRANSFER CONFERENCE

http://www.wptc2016.org/ (Aveiro)

http://www.wptc2017.org/ (Taiwan)

OSSiQ

What does WPT need?

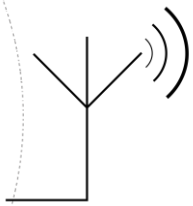
ITU

ANACOM AUTORIDADE NACIONAL DE COMUNICAÇÕES

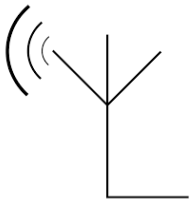
Proposal:
Christos Kalialakis, Nuno Borges Carvalho, Naoki Shinohara, Apostolos Georgiadis

http://www.standardsuniversity.org/e-magazine/june-2016/selected-developments-wireless-power-transfer-standards-regulations/

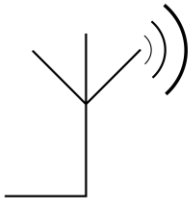
Experimental Setup



WIFI tx



WIFI rx



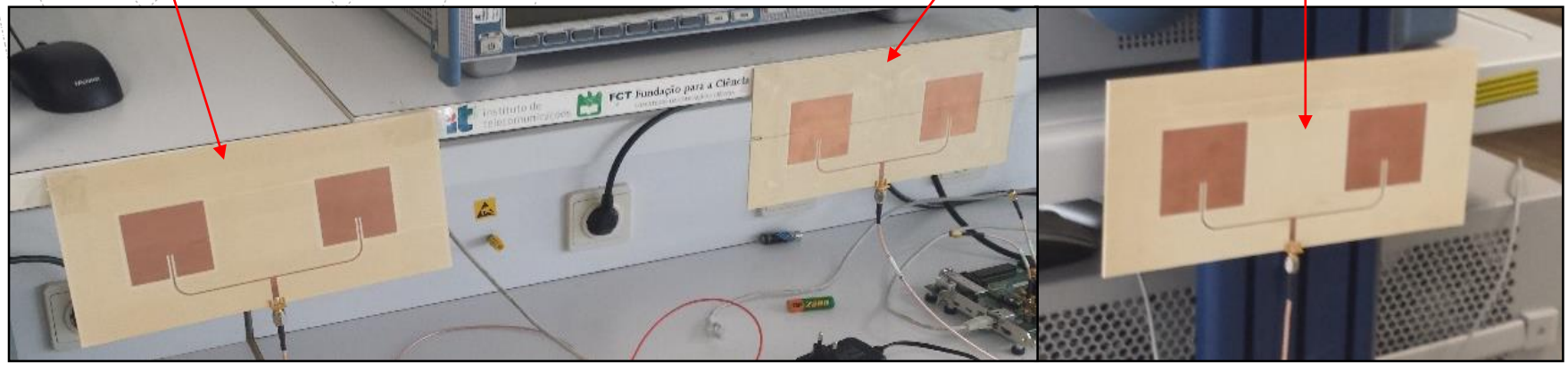
WPT Interferer tx

Experimental Setup

WPT tx

WIFI tx

WIFI rx



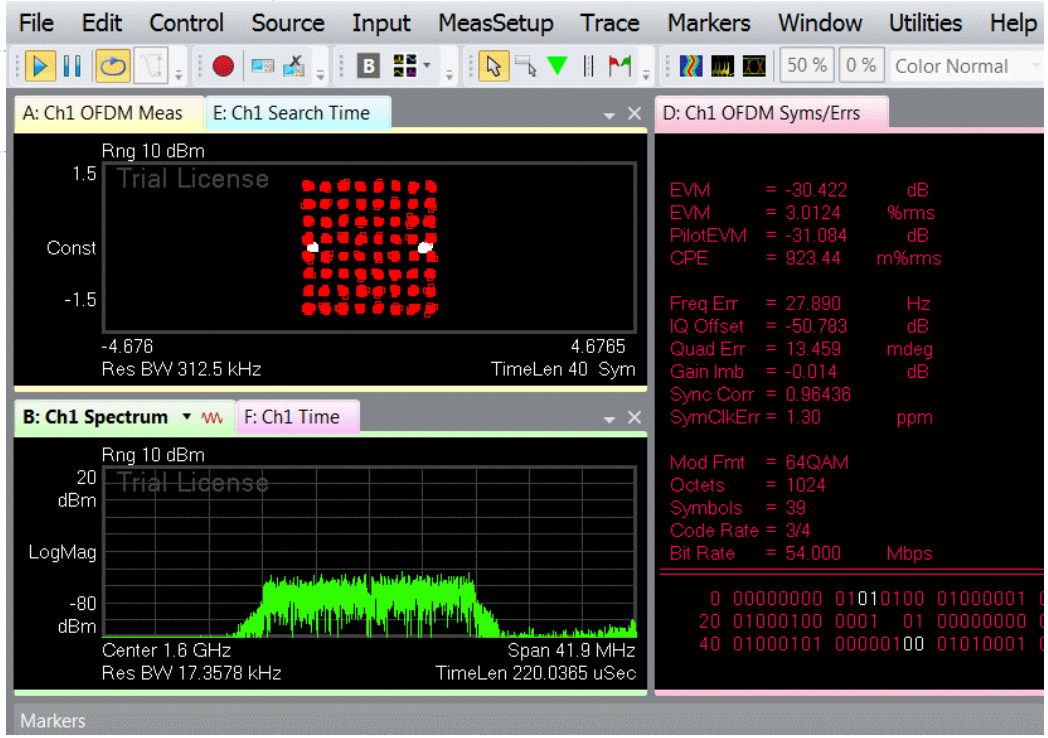
Distance between transmitters	30 cm
Distance transmitter – receiver	200 cm

PHY WIFI 802.11A Signal

Carrier frequency – 1.6GHz

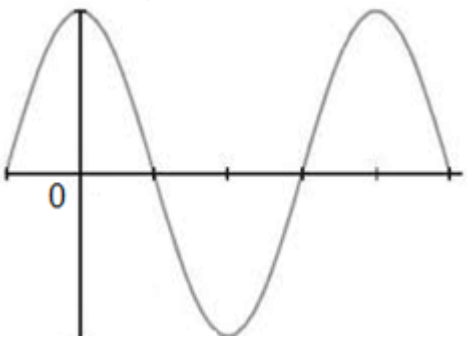
Symbol rate – 16.8GSym/s

Power – 7.71dBm

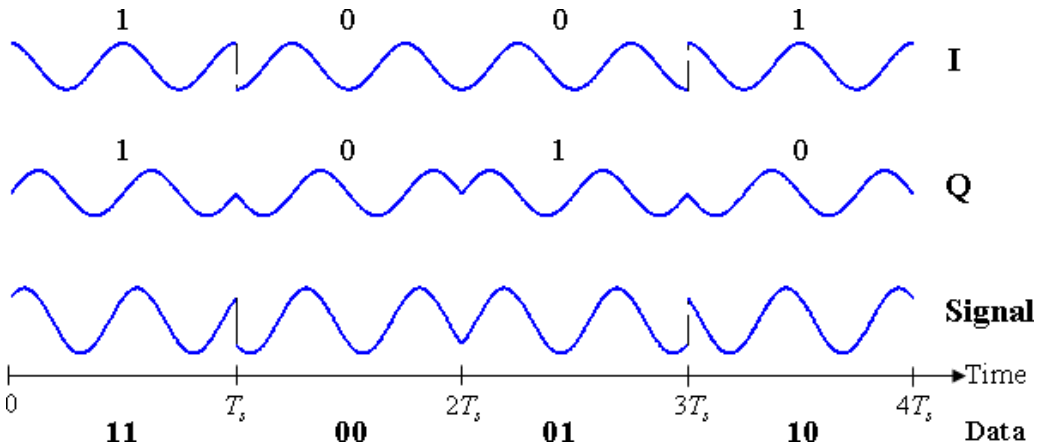


WPT Interferer Signal

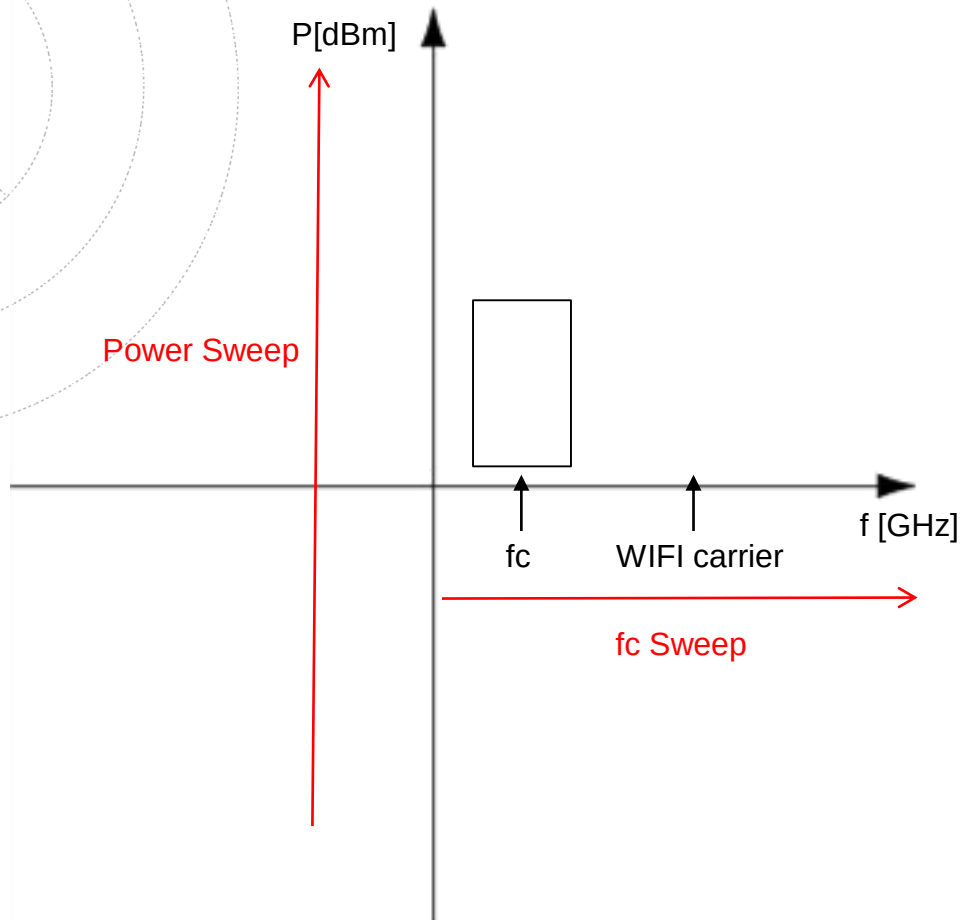
Case 1 - Tone



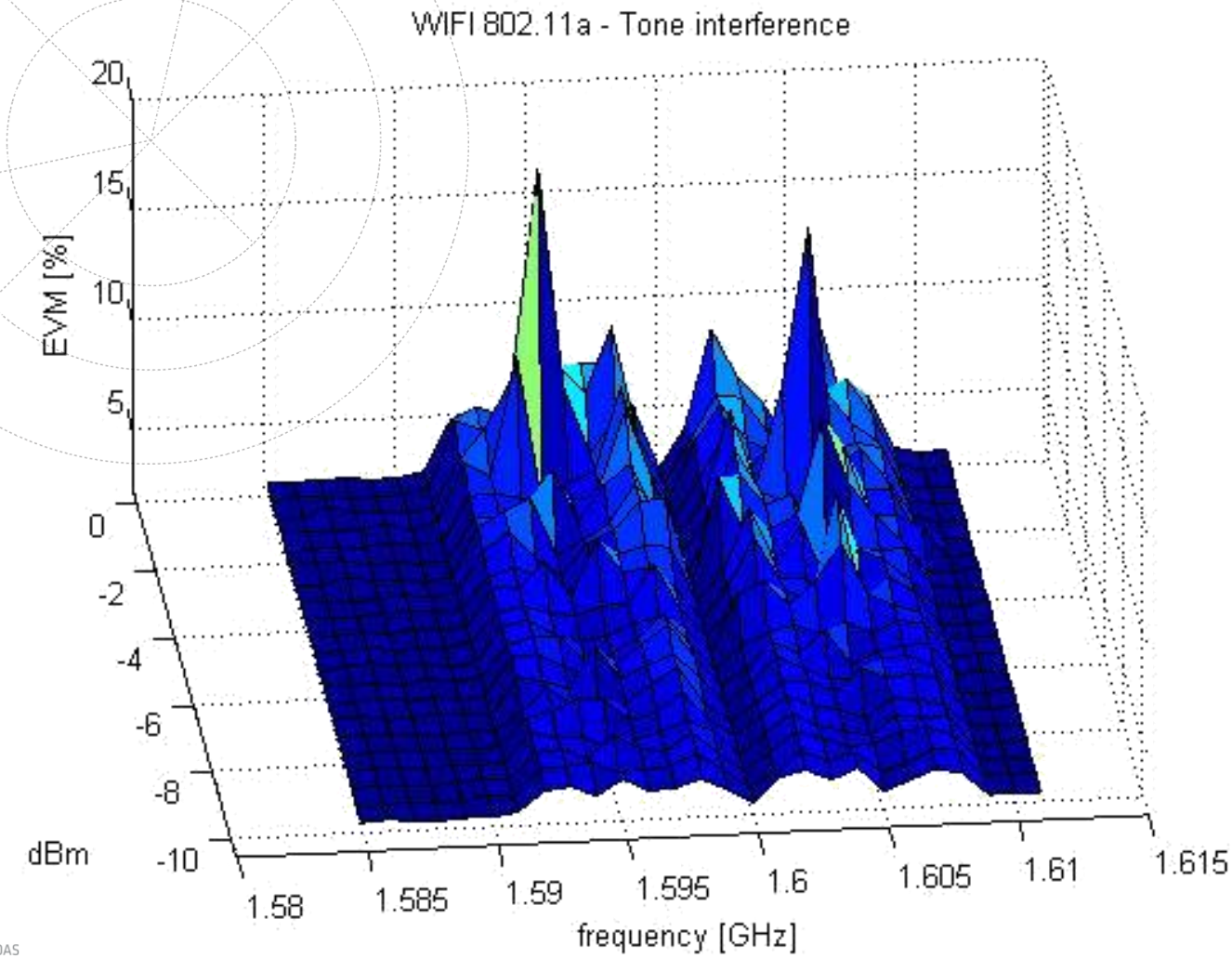
Case 2 - QPSK



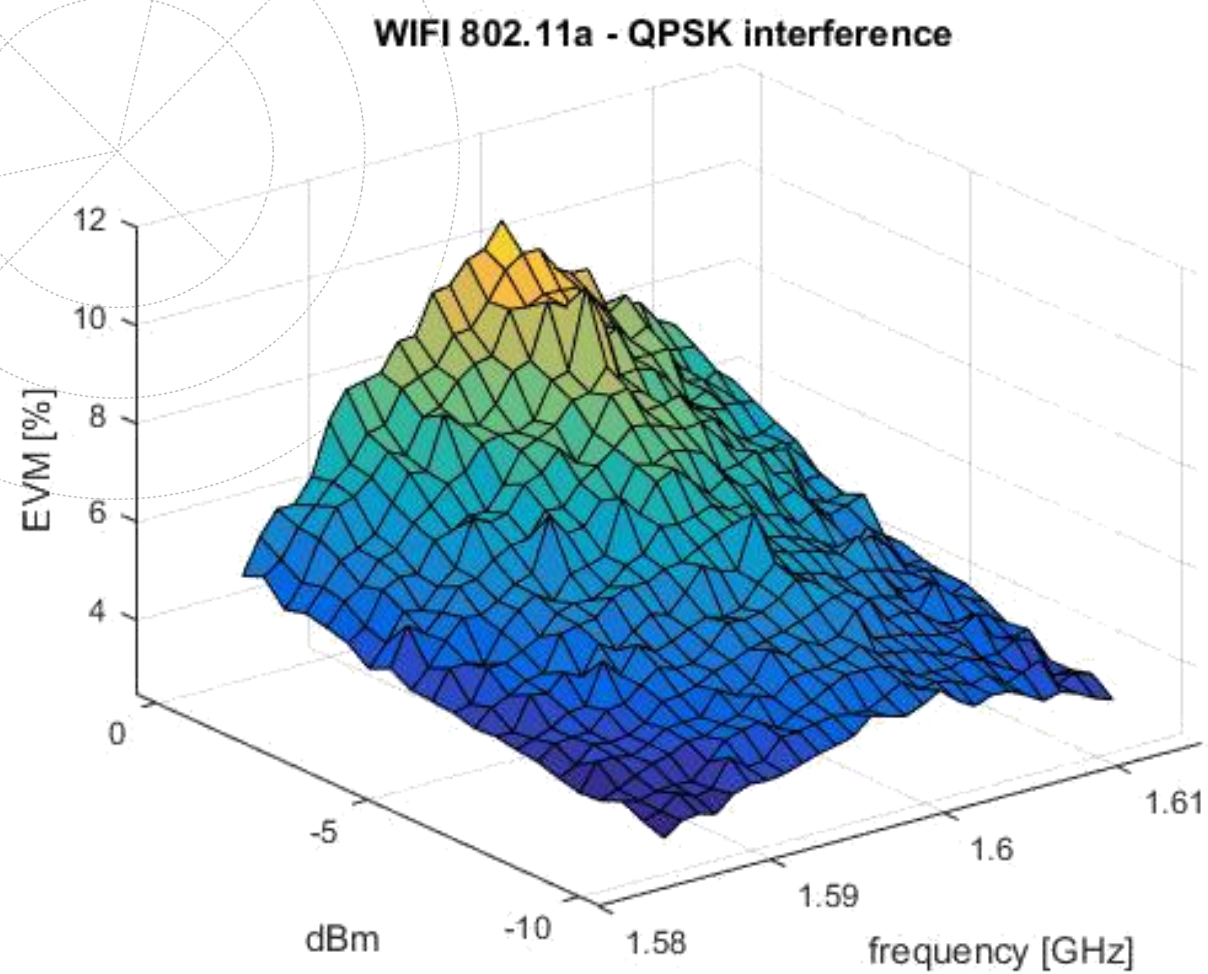
WPT Interferer Signal



Experimental Results



Experimental Results



Experimental Limitations

- Study performed at 1.6GHz
- Saturation of the measuring equipment
- Use of trial software to preform WIFI demodulation
- No teoretical model to evaluate results

Further Investigation

- Develop a theoretical model
- Design similar antennas that operate at 5.8GHz
- Preform new measurments
- Better understand the limitations of interfering WPT with other signals
- Achieve allocation of ISM 5.8GHz band for WPT applications

Thank You For Your Time!