FIT-R2lab

An open testbed for reproducible wireless networking research

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Outline

1. Scientific context
2. Reproducible Research Lab
3. Collaborations and future directions

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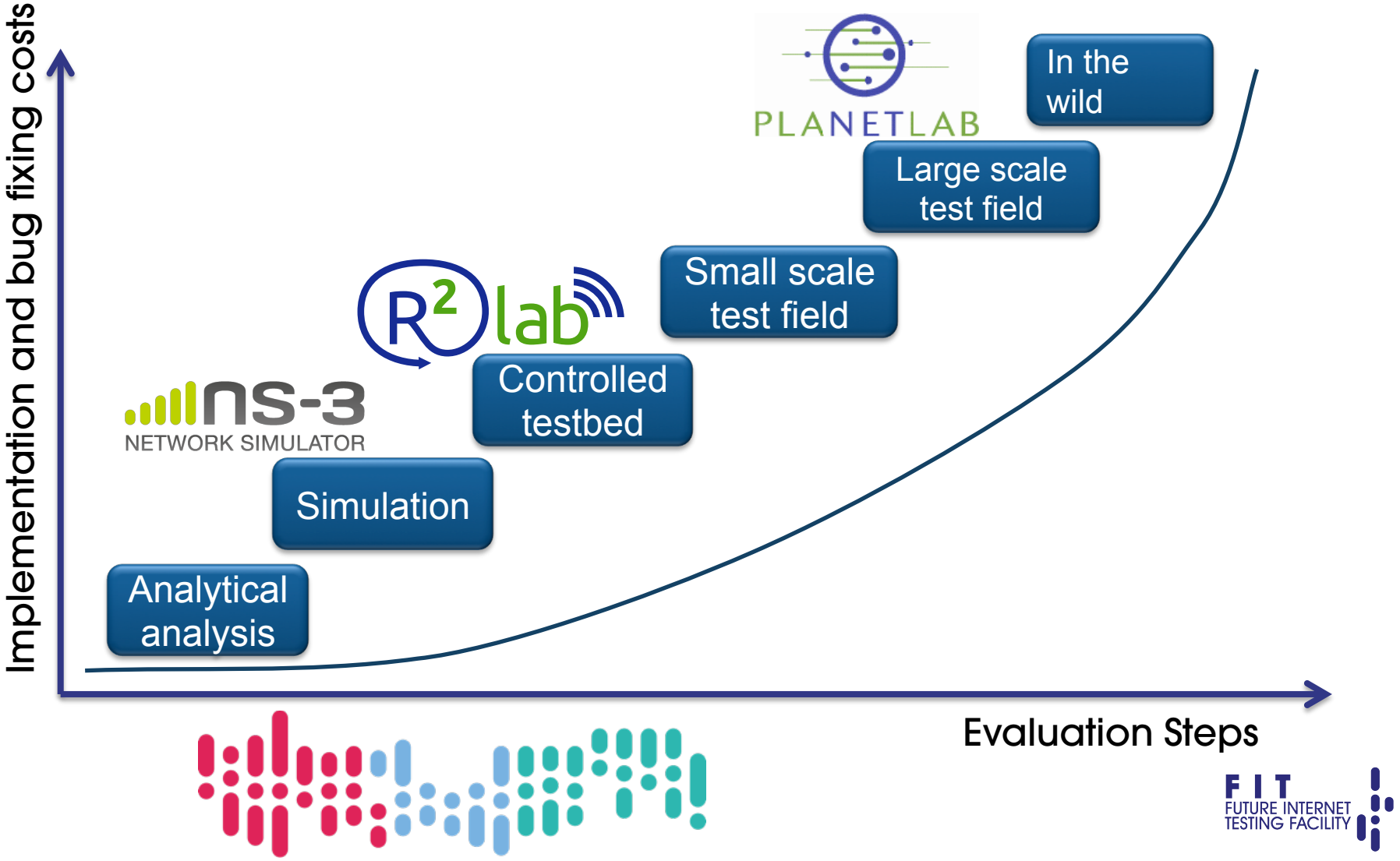
TESTING FACILITY

Networking Protocols Evaluation



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Reproducible Research Lab

- Hardware
- Software
- Main features
- Positioning

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Faraday Cage

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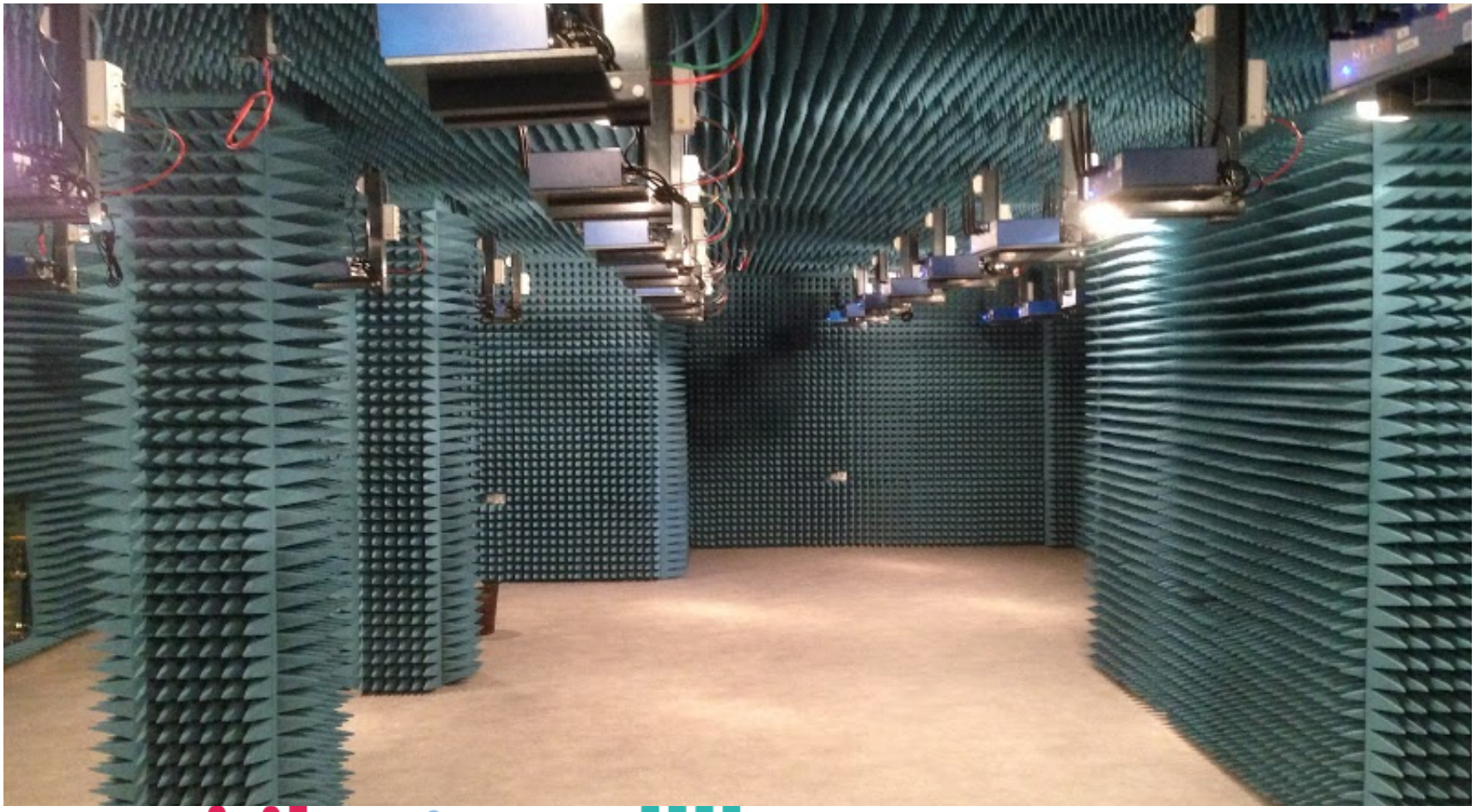
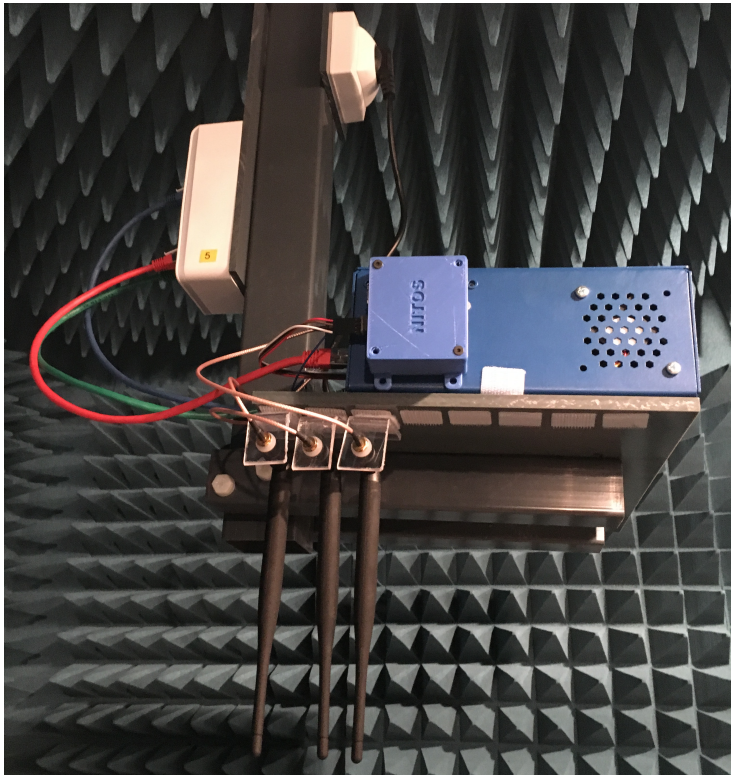
RF absorbers

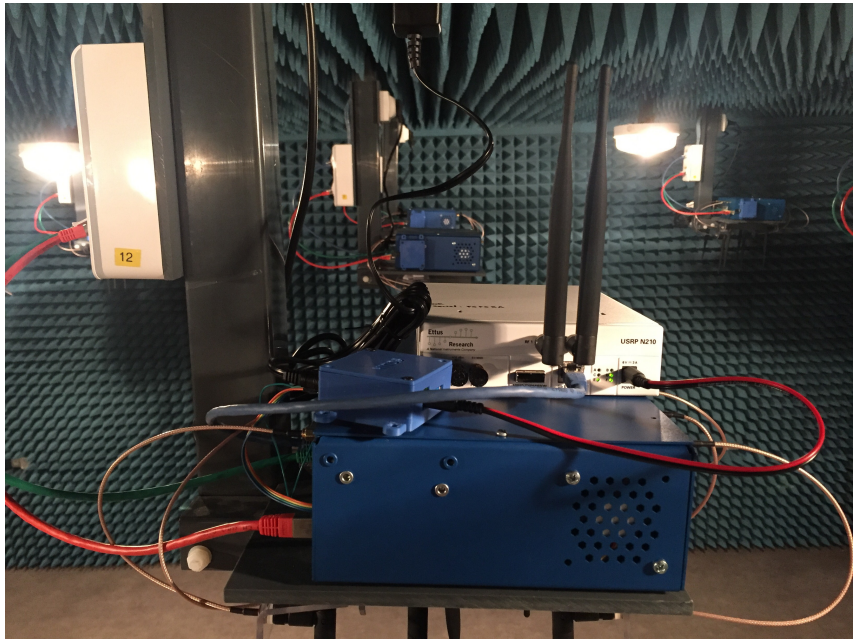


WiFi Commercial hardware




V2
NITOS
NETWORK IMPLEMENTATION TESTBED LABORATORY
22
pass
ICARUS
10/09/2014
inria
04005103
Serveur Wireless Icarus Nodes
N/S : 00031D0E0337
CDE : 114264

Software Defined Radio



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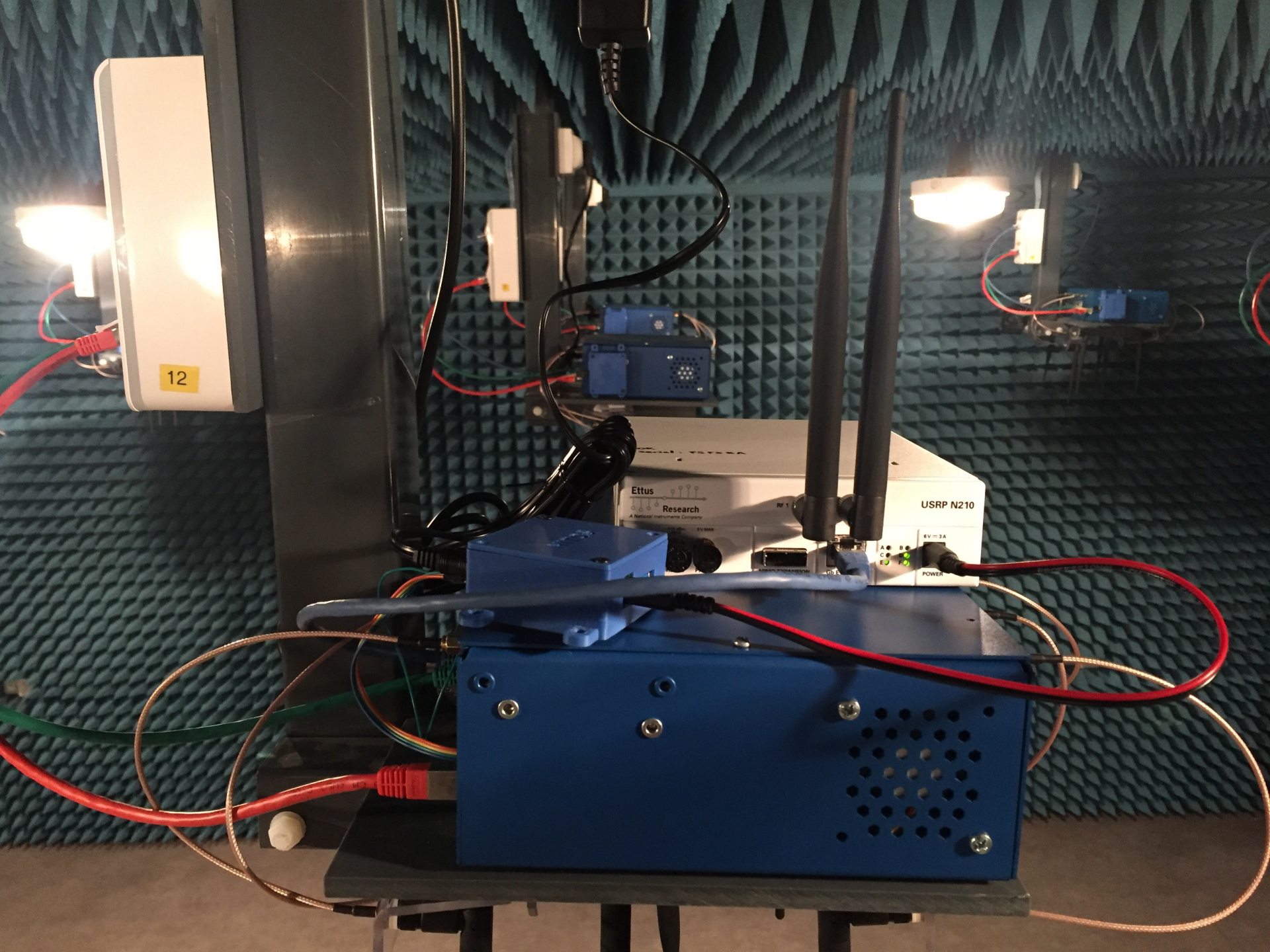
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Ettus
Research
A National Instruments Company
USRP N210
POWER

Software

- Open Air Interface for 5G scenarios
- GnuRadio for SDR experiments
- Efficient Experiment controller
- DCE/ns-3 emulator

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Main Features

- Federated with OneLab platform
- Reservation of the whole testbed
- Full remote control of nodes
- Deploy scenarios & collect results

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R2lab Positioning

- Commodity hardware
- Remote access and deployment tools
- Reproducible end-to-end scenarios
- E.g. 5G VRAN with OAI support

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Three anechoic chambers?

- Important instrument, different usages
- CorteXlab: Cognitive Radio and physical layer of wireless communications
- LEAT: high precision antenna propagation

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Joint Position and Orientation Estimation

- Hot topic, several applications
  - Smart Home, Geo-fencing, VR, Indoor navigation, personal drones, etc.
- On commodity Wi-Fi infrastructure
  - Accuracy requires calibration
- R2lab provides controlled conditions to calibrate

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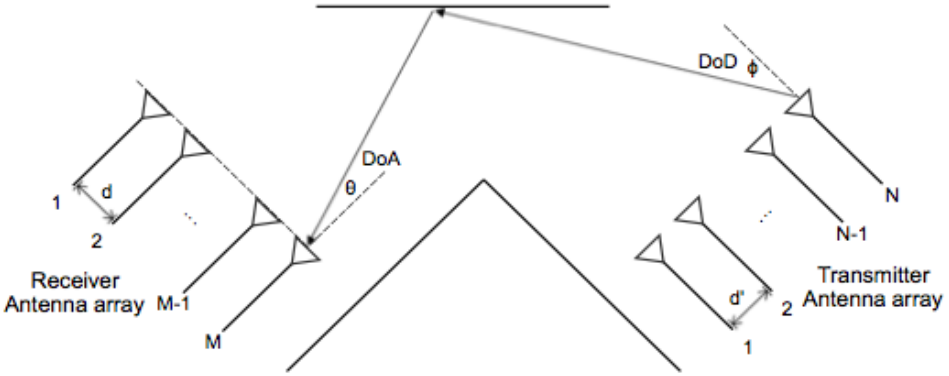
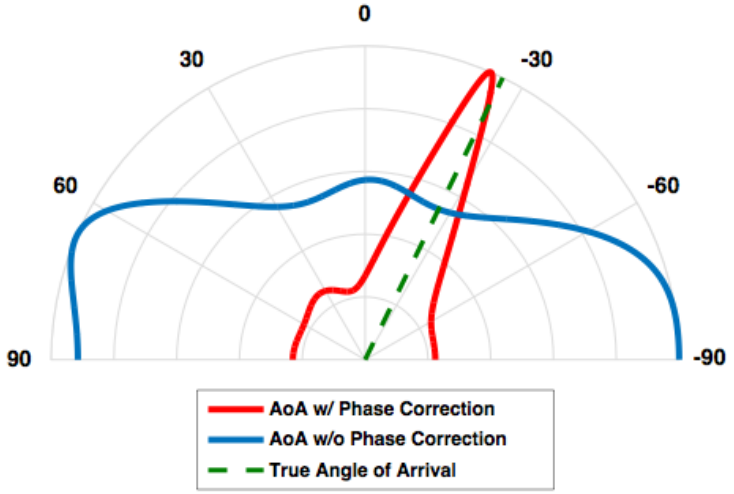
Phase Correction in a controlled environment

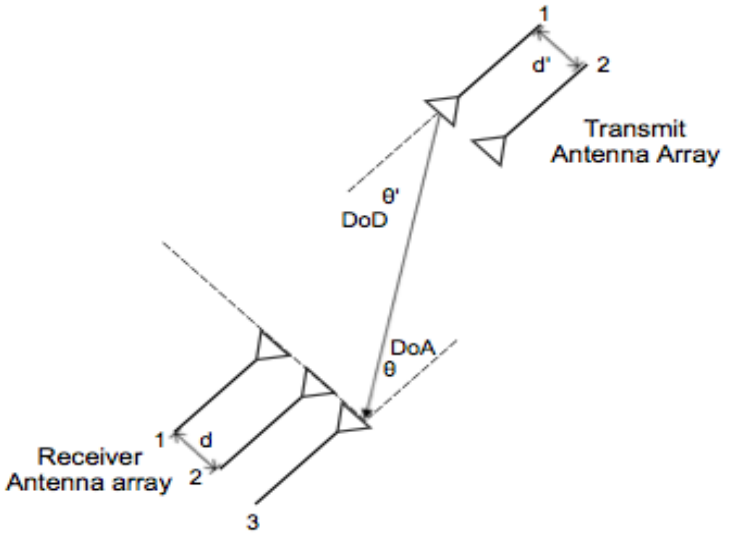
- Phase shifts used to estimate directions
- Random RF oscillator phase offset.
- Correction using a Polaris node

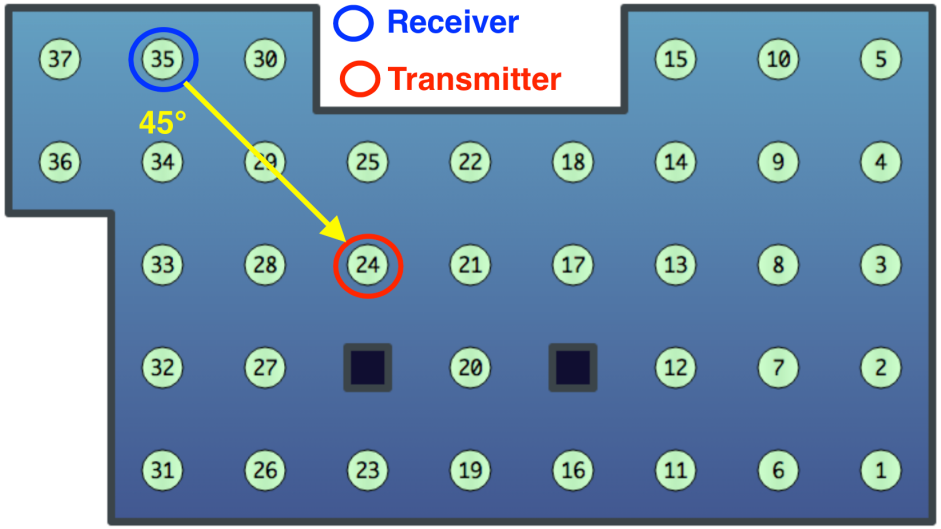


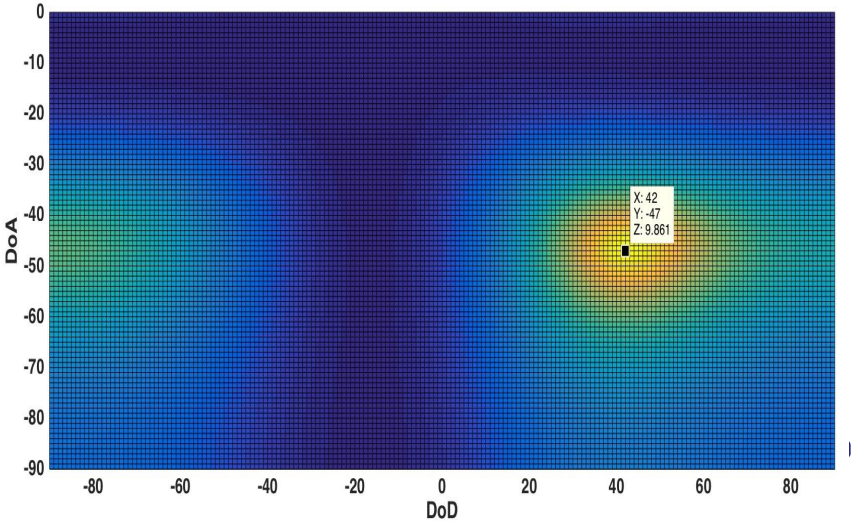


LOS Scenario

- LOS Scenario estimation:
  - Angle of arrival: -47°
  - Angles of departure: 42°
- Estimation with 2D-MUSIC







Collaborations and future directions

- PhD on Cross Layer Optimizations in MIMO (LEAT) – Labex UCN
- Post-doc on 5G Network splitting and VF placement (Eurecom) – Labex UCN
- Validation of Mininet WiFi (U. Campinas)

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Collaborations and future directions

- SDN based routing in WiFi-mesh networks (U Queensland)
- Scalable Multicast Service in Software Defined 5G networks (Associated team: UHD-on-5G with NICT)
- Fed4Fire+ : Testbed federation

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Sign Up now

For more information, contact:
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