



Camille DELFAUT

Ph.D. thesis (2018-2021)
LGP2 (N. Reverdy-Bruas,
Denis Curtil)
IMEP-LaHC (T-P. Vuong)

3D printed electronic for Molded Interconnected Devices (MID) dedicated to internet of Things applications

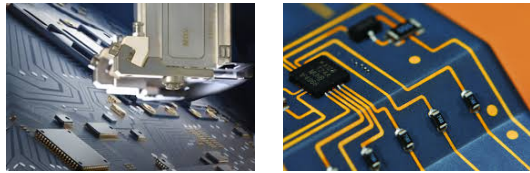
Impression robotique 3D de circuits plastroniques pour des applications Internet des Objets

Context

Application

- IoT (Internet of Things)
- Radio frequency area
- Additive functionalities

Advantages of printed electronics on thermoplastics



- 3D or complex surface
- From customization to mass production
- Additive printing

New market

- Car manufacturing
- IoT
- Telecommunications
- Health

In collaboration with



Funded by



Objectives

Printing process

- Robot trajectory
- Dispensing system
- Synchronisation between printing head and robot
- Impact of curing
- 3D thermoplastic substrate and complex surface

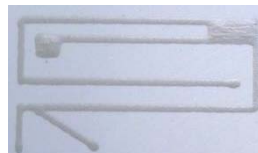
Printing processes

- **Jetting**
- **6 axis robot**

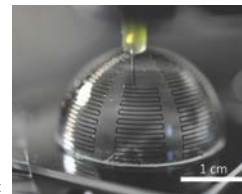


Development of a prototype

- LoRa antenna
- RFID Tag
- Sensor
- Circuit



Antenna printed within present project



Methods

Parameters

- Influence of printing parameters : different printing heads, printed surface
- Influence of curing

Surface characterization

- Morphological studies : Alicona, mechanical profilometer, adhesion test

Electrical characterisation

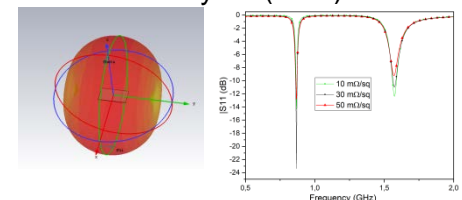
- Four probes

Radio-frequency (IMEP-LaHc)

- Anechoic chamber



- Network analyser (VNA)



Simulation performed within present project

