

INTEL-IRRIS

Intelligent Irrigation System for Low-cost Autonomous Water Control
in Small-scale Agriculture



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Intel-Irris



PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA

Intelligent Irrigation System for Low-cost Autonomous Water Control in Small-scale Agriculture



Building the INTEL-IRRIS IoT platform Annex-2: antenna tests



Prof. Congduc Pham
<http://www.univ-pau.fr/~cpham>
Université de Pau, France



A photograph of a young green plant with several leaves growing in a field. In the foreground, a black drip irrigation pipe runs horizontally across the frame. The ground is covered with light brown soil and small rocks. The background is slightly blurred, showing more of the field.

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INDOOR ANTENNAS

Antennas placed indoor

- 4 different antennas at the same location, receiving same packets
- 4 Gateways, 433Mhz
- DIY Ground Plane
- 3dBi fiber glass (RAK)
- "3dBi" -> referred to as "Small" (S)
- "5dBi" -> referred to as "Medium" (M)

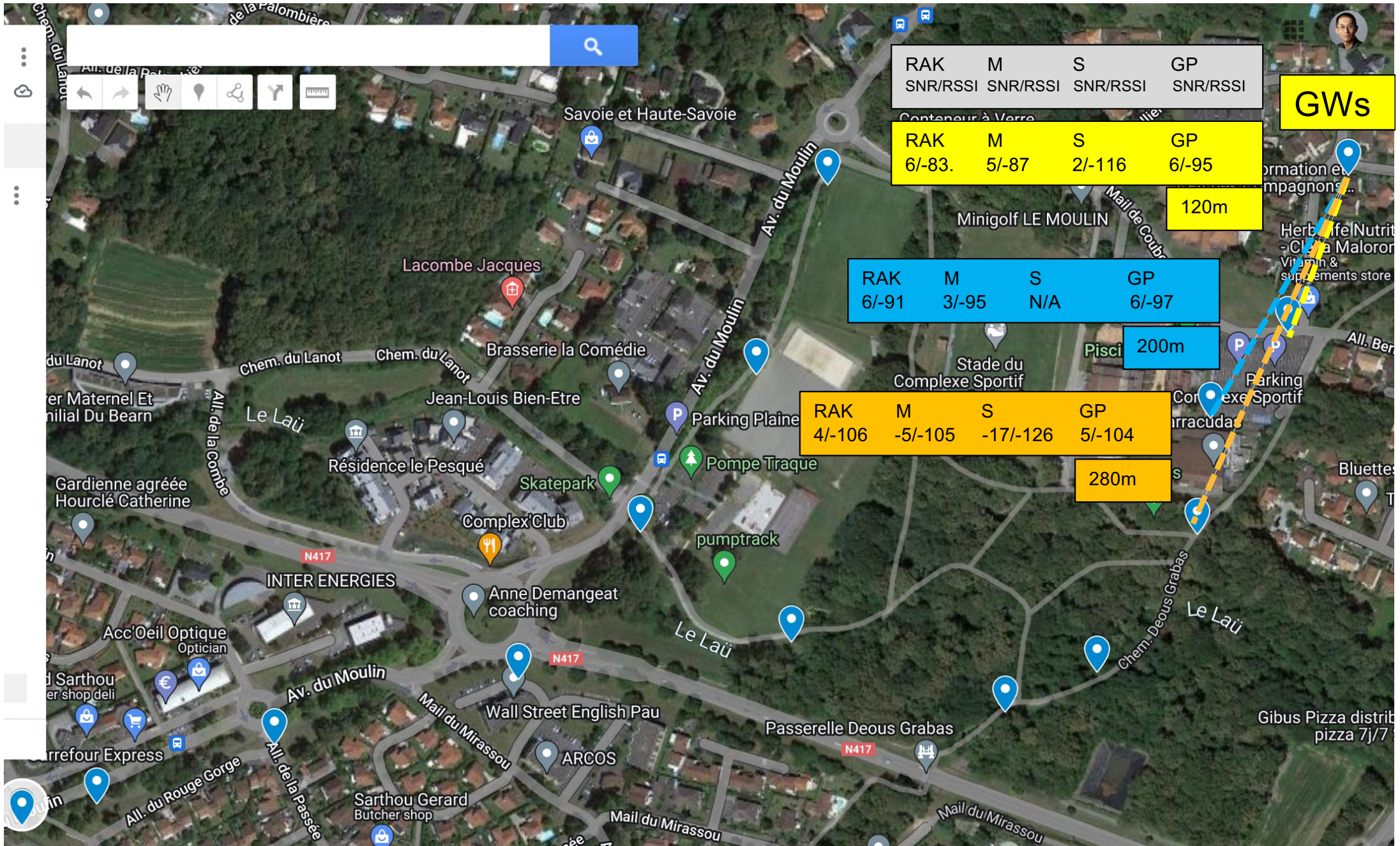


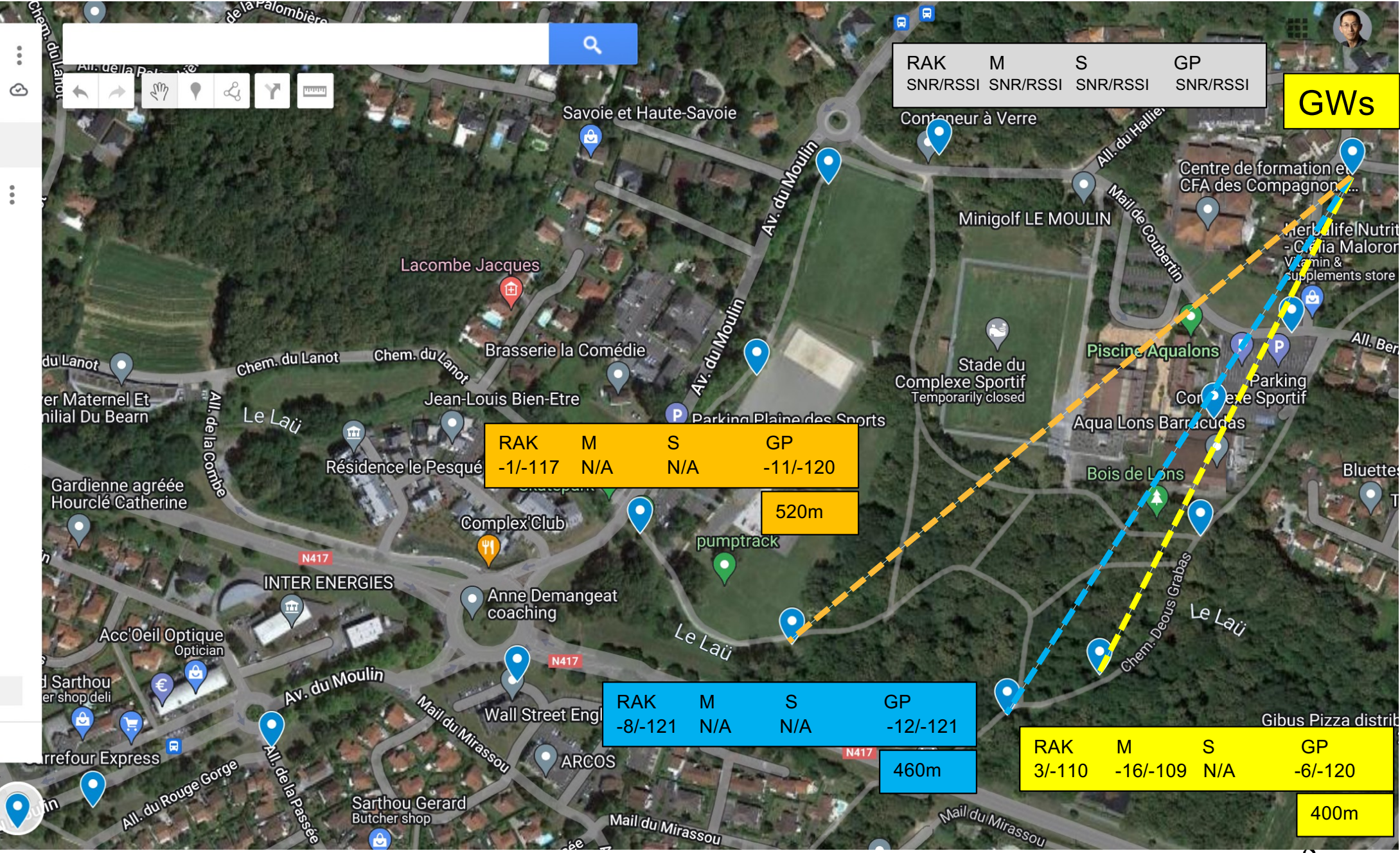
Transmitter device (1)

- ◉ We use the Field Tester device but we did not expect any correct acknowledgment from gateways as since there are 4 gateways, their ACKs will most probably collide and interfere each other
- ◉ The transmitter antenna is the "Small" one

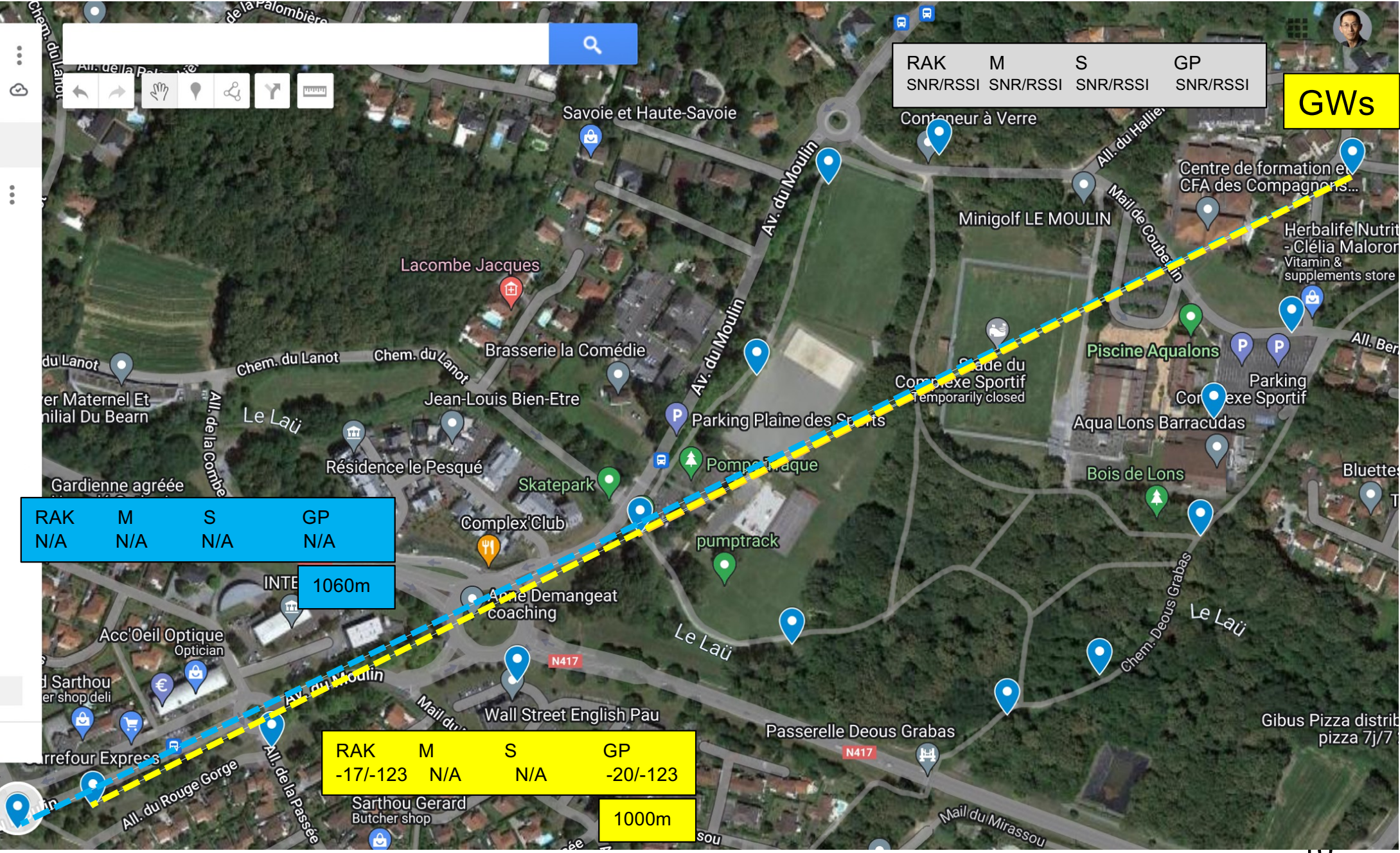


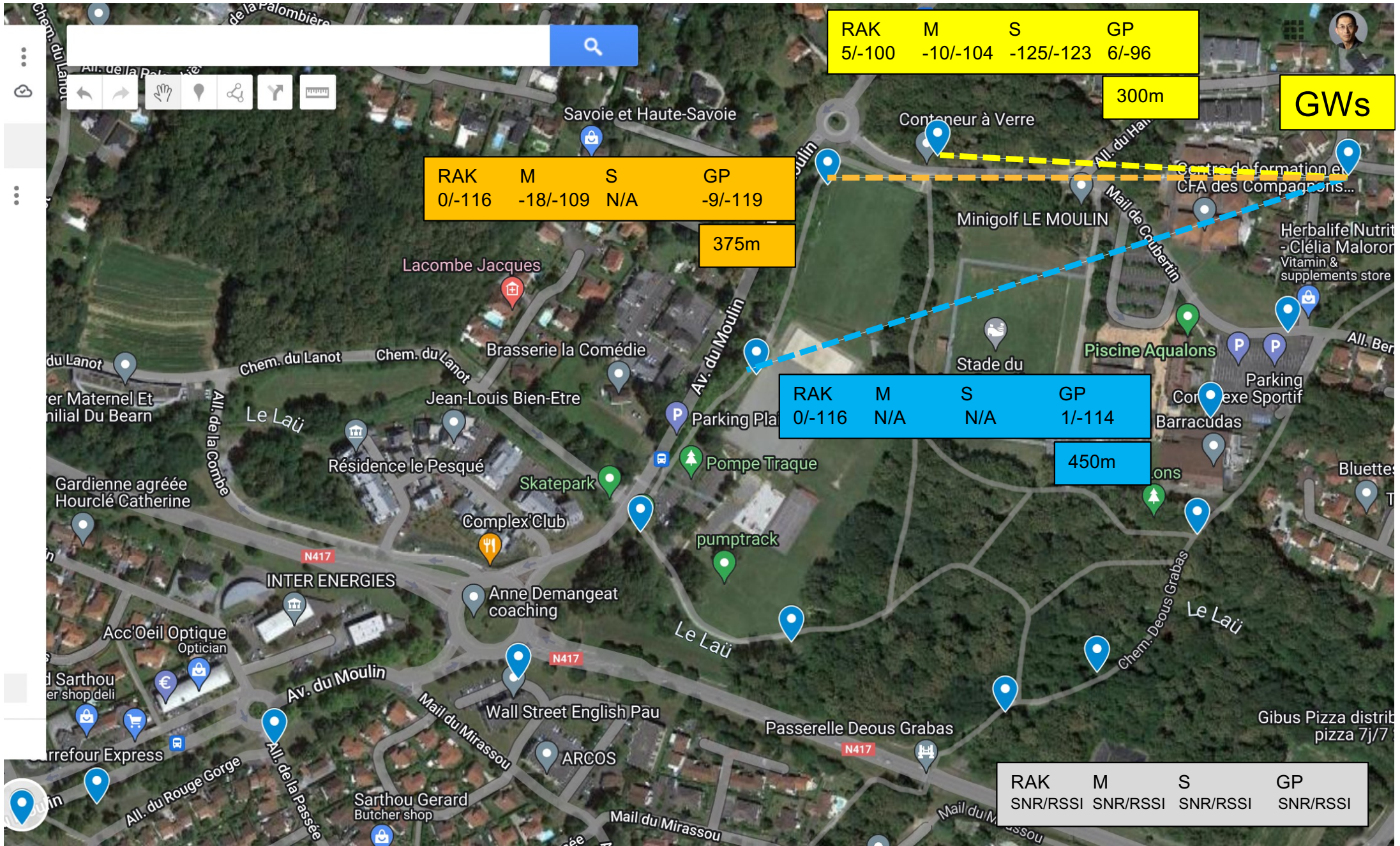












Transmitter device (2)

- ◉ We use the Field Tester device with the medium antenna to see if this would improve transmission & reception
- ◉ The transmitter antenna is now the "Medium" one
- ◉ We start at the position where no reception were received (blue)





Conclusions on indoor antennas

- ⦿ The small "3dBi" has limit at about 300m
- ⦿ The medium "5dBi" has limit at about 400m, if less obstacle it can probably receive at 600m
- ⦿ The RAK fiber glass & DIY GP has limit at about 1km
- ⦿ The RAK fiber glass is more performant than the DIY GP but costs about 30€, with the base, it is about 50€
- ⦿ The DIY GP costs about 10€ with the extension cable SMA male-> N-male. The DIY GP is quite good actually!
- ⦿ In typical agriculture fields, with less obstacle, we could probably add 300m to 500m to all the reached distances
- ⦿ Having "bigger" antenna at device side is not really interesting, it is probably better to put gateway's antenna in higher position
- ⦿ Having the gateway's antenna outdoor, at 3m height, in typical agriculture fields, can probably add an extra 1km!