

# CIThARA WP2: Citizen measurement data

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*Jean-Marc Bertho, ASNR*

*On behalf of the WP2 participants: P. Fattibene (WP leader), C. Andenna, M. Benadjaoud, J.M. Bertho, E. Cisbani, S. Della Monaca, T. Falcone, R.V. Gagliardi, T. Hamburger, I. Korsakissok, K. Pele, G. Stendardo, C. Woda.*

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# General objective

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- WP2 aims to develop AI-based tools to improve the quality of citizen measurement data and evaluate their potential integration into official environmental monitoring network data and modelling frameworks.
- Uses the OpenRadiation network and database as a model system for WP2 work
- Participants: ANSR, BfS, CEPN, NMBU, lead **ISS**
- Four tasks:
  - WP2.1: AI tools to enhance CM data quality, reduce noise and understand local variations. Provide “cleaned” datasets to WP2.2.
  - WP2.2: Comparison and integration of CM data and OMN data: evaluation of consistency and useability
  - WP2.3: Probabilistic models simulating CM networks to evaluate the added value of including CM data into AI modelling tools (link with WP3).
  - WP2.4: Transferability of the data-quality AI-driven approach to other existing measurement networks.
- Follow-up of the WP2 work by WP4 (See talk by T. Schneider, “Mastering Trust in AI for Crisis Management”)

## And practically? WP2.1: AI tools to enhance CM data quality

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- Work on the whole Open Radiation database, as fixed on January 1<sup>st</sup>. 1.3 million measurements with 63 metadata each
- Objectives: Assess data availability, completeness and representativeness across variables
  - Identify main intrinsic parameters that are source of uncertainty
  - Investigate the presence and origin of outliers
  - Quantify the role of statistical uncertainties and associate an uncertainty to each measurement based on duration, number of hits, etc.

## WP 2.1: General strategy

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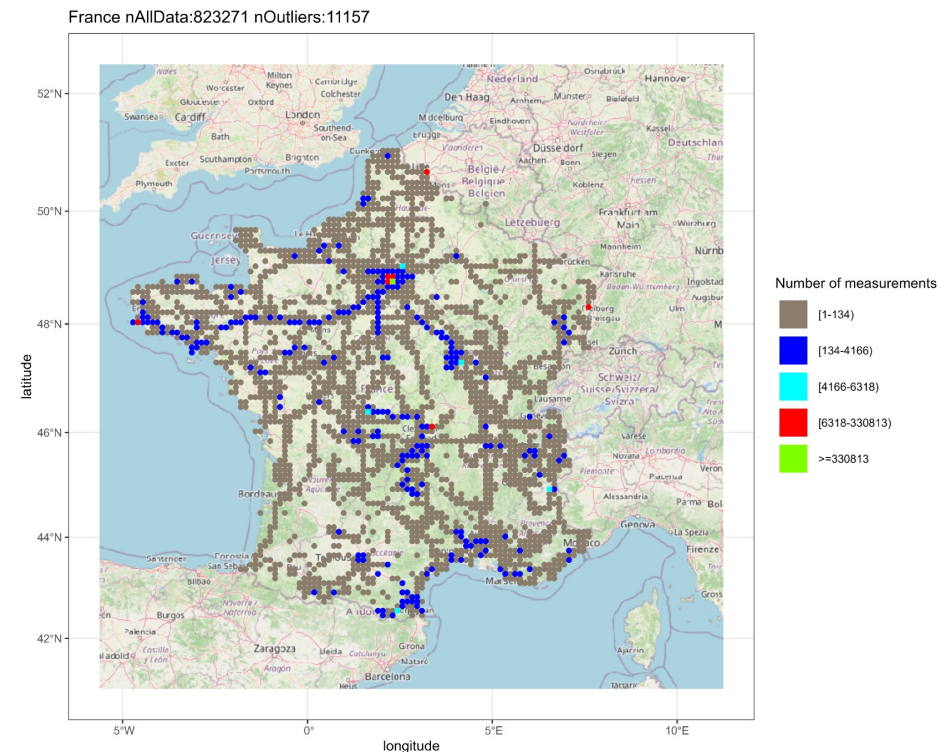
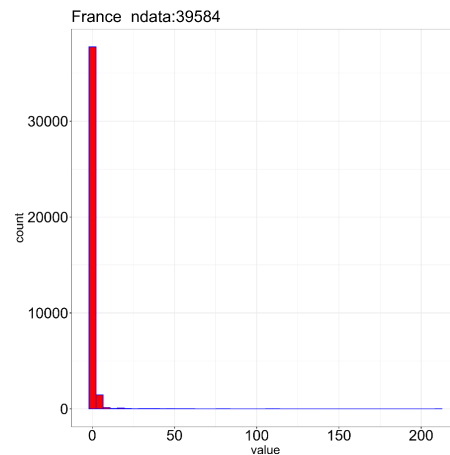
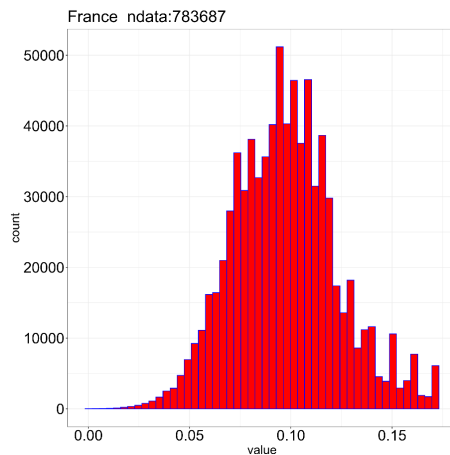
- Step 1- cleaning the dataset
  - Convert data to consistent format
  - Exclude incomplete data: lack of start time, geolocation, value.
  - Exclude or flag non-physical data: dose, hits or altitude  $\leq 0$
- Step 2: filtering the dataset to select reliable ground-level measurements
  - Exclude data obtained on board a plane or showing flight-related variables

**Outcome:** dataset suitable for background radiation analysis (-> Ground rows: 1,185,871 lines)

- Step 3: Starting the work on data analysis
  - Look at distribution of data according to available parameters (intrinsic parameters): duration of measurement, number of hits, environment, height, apparatus, etc.
  - OUTCOME This preliminary analysis demonstrates that a multiparametric approach, including temporal and spatial structuring, is needed to identify and explain outliers;
  - Need for extrinsic parameters (e.g. geological maps, contextual maps, ...)

# WP 2.1: Sample of preliminary results

- Data density map
- Allow identification of areas of interest
- Shows that most of results are in the usual range
- 1-2% of data above 0.3  $\mu\text{Sv/h}$



## WP2.2: Comparison and integration of CM data and OMN data

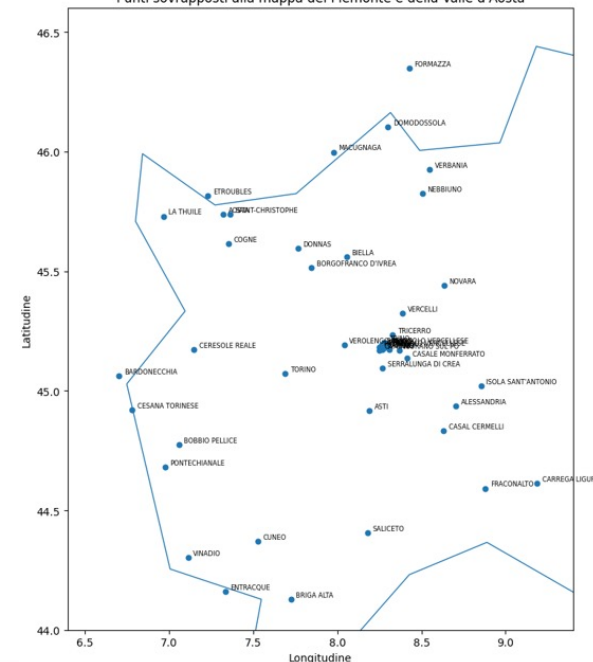
- Taking advantage of existing environmental monitoring networks: Teleray in France, RESORAD in Italy
- Data extraction from CM database, standardization of data formats, measurement units and geotemporal annotations
- Comparing results from the official and CM networks



Teleray network

### Resorad network Piemonte / Val d'Aoste

Punti sovrapposti alla mappa del Piemonte e della Valle d'Aosta



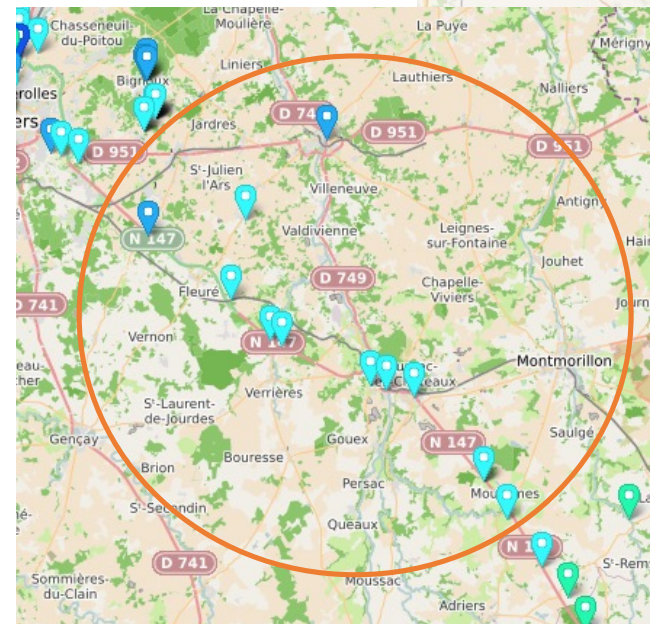
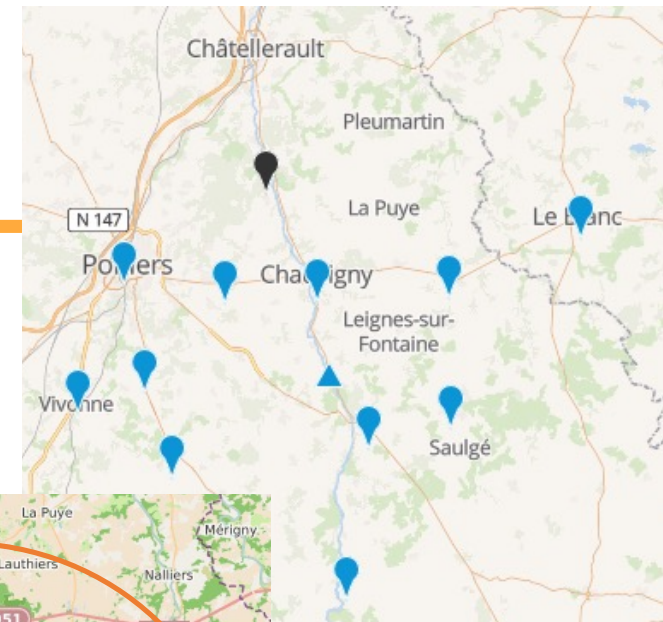
## WP2.2: preliminary results

- Creation of a catalogue of 25 French nuclear plants of interest for the WP2.2
- Data extraction from CM database, standardization of data formats, measurement units and geotemporal annotations
- Alignment for temporal resolution (hourly/daily) and spatial matching rules
- 140/480 Teleray Probes are present around the selected nuclear plants
- 4 selected nuclear plants
- 1 more for a citizen-led action

| OR_Location          | OR_nbMeasures | OMN_nbProbes |
|----------------------|---------------|--------------|
| Belleville-Sur-Loire | 62            | 4            |
| Blayais              | 161           | 10           |
| Brest                | 324           | 16           |
| Bugey                | 271           | 11           |
| Cherbourg            | 322           | 2            |
| Chinon               | 145           | 4            |
| Chooz                | 109           | 0            |
| Civaux               | 131           | 7            |
| Cruas                | 285           | 6            |
| Dampierre-en-Burly   | 118           | 4            |
| Fessenheim           | 250           | 0            |
| Flamanville          | 287           | 5            |
| Golfech              | 214           | 13           |
| Gravelines           | 204           | 7            |
| La Hague             | 236           | 9            |
| Malvesi              | 228           | 1            |
| Marcoule             | 388           | 16           |
| Nogent sur seine     | 400           | 1            |
| Paluel               | 216           | 8            |
| Penly                | 203           | 4            |
| Romans-Sur-Isère     | 362           | 16           |
| Roscanvel            | 400           | 4            |
| Saint-Alban          | 84            | 0            |
| Saint-Laurent-Nouan  | 97            | 3            |
| Toulon               | 295           | 6            |
| Tricastin            | 307           | 17           |

## WP2.2: preliminary results

- Civaux NPP: 7 beacons 5-20 km from the NPP + 24 at the site limits
- Low number of CM in this area
- The local information committee (CLI) is interested in developing a CM action
- Organization of a measurement challenge during June-September 2026
- Implication of local NGOs and all municipalities
- Objective: > 5000 measurements in a short time frame
- Co-analysis and co-interpretation of the results
- Interviews and survey study (link with WP4)



# Thank you for your attention

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