

In a context where polarimetric technique is becoming widespread in operational networks, NOVIMET has developed a **revolutionary technology** for meteorological radars. Thanks to an algorithm based on a "physical" inversion model (**ZPHI® algorithm**), protected by 4 patents, the company is able to recalibrate **in real time, for any type of precipitation and under any climate**, the relationship between the radar signal and the rain /snow /hail characteristics. ZPHI® provides directly, without ground equipment, an accurate estimate of the **precipitation on the ground** (whether rain, snow or hail). ZPHI® can be used to process data from **all types of dual pol weather radars** (C, S or X band).

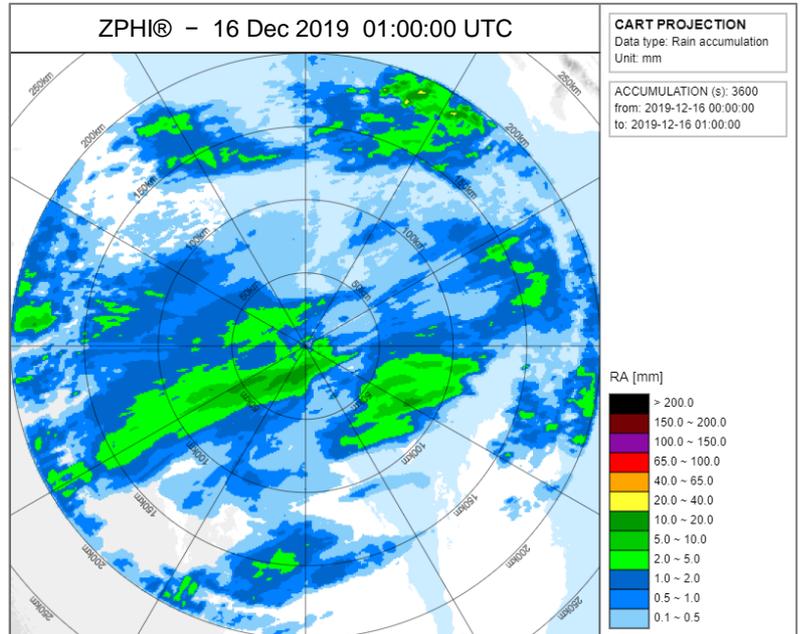
Widely referenced in the international scientific community, ZPHI® produces high resolution and high accuracy rain maps, **without using rain gauge data**. The latter are used only as verification data, which is a breakthrough with respect to previous technologies.

### FUNCTIONALITIES

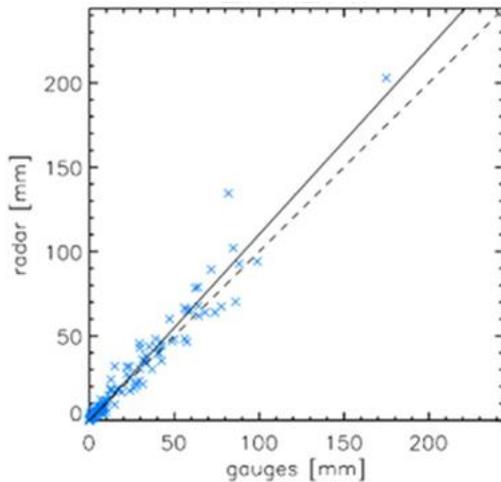
- Correction for along path rain attenuation.
- Correction for radar calibration error.
- Hydrometeor classification (rain, snow, hail).
- QPE (Quantitative Precipitation Estimate) automatically adjusted for the natural variability of the PSD (Particle Size Distribution):
  - along the ray;
  - projected to the ground.
- Validation tool for comparing available rain gauge data with radar rain maps at collocated pixels.

### PRODUCTS

- Monitoring of the radar calibration error.
- Ground precipitation map for rain / snow / hail.
- Accumulated precipitation (1 to 24 hour).
- Real time and 2-hr anticipated precipitation maps (distinguishing rain, snow and hail).
- CAPPI for various measured parameters.



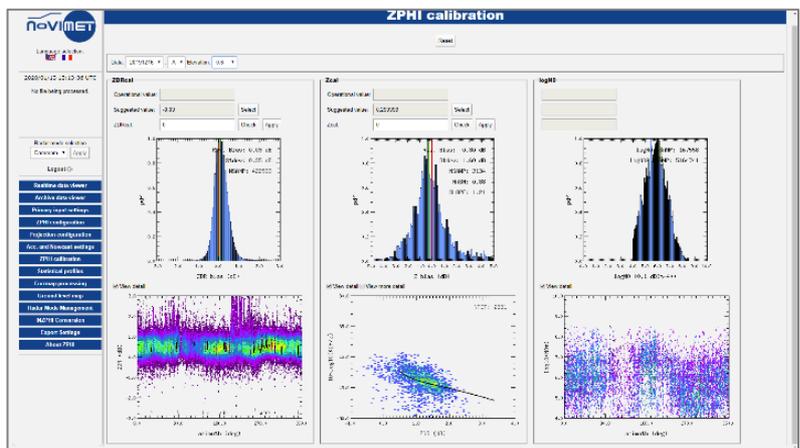
Map of rain accumulation.



Radar-rain gauge validation scatter plot.

### PROOF OF CONCEPT

ZPHI® has been used for real-time processing on the X-band HYDRIX® radar installed in the south of France, and on the C-band Météo France's radar at Trappes (near Paris). It has been validated by comparisons with rain gauge network measurements from a four-year data set (2004 to 2008).



Self-consistency calibration tool.

"Novimet's ZPHI® software was coupled to the Météo France polarimetric radar in Trappes near Paris (5 cm wavelength) for the entire year of 2005. Once the tricky reflectivity calibration issue was resolved, it was objectively observed that precipitation accumulations from ZPHI® were more accurate than the operational ones, especially for rain rates over 3-4 mm per hour."

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