OPTIRAIN

Improving rainfall data quality

Contact information

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Technological Offers type

Technological solutions

Research and innovation areas

- Agriculture, Forestry, Natural Resources, Land Use and Blue Growth
- Climate, Energy and Mobility

ODS

Where?

Irrigation hydraulics

Keywords: | hydrological management | pluviometer

Brief description of the solution and the added value it delivers

System for correcting measurement errors in tipping-bucket rain gauges.

Description of the technological basis

The proposed solution reduces measurement errors caused by variation in rainfall intensity by 80% and characterises the behaviour of the mechanism in tipping bucket-type instruments for measuring fluids. It characterises the addition of excess amounts during the movement of the tipping bucket and the reduction in the nominal tipped volume.

The method is contained in a piece of software, allowing it to run automatically and in near real time. It is also an easy-to-implement system that can be used with different rain gauges by simply changing the initial parameters of the model.

'Fast and efficient correction of errors in rainfall measurement'

'Improving the performance of the most competitive rain gauges on the market'

Business needs / application

- Weather monitoring worldwide – and, in particular, rainfall monitoring – has increased significantly in recent years, due to the emergence of new technologies and the widespread interest in water resource management.
- The increase in monitoring goes hand in hand with an increase in demand for a greater temporal and spatial frequency of data, as well as for more precise and higher-quality data, principally intended for real-time handling.
- The tipping-bucket rain gauge is the most widely used instrument worldwide for measuring rainfall, due to its simplicity (easy to make), its low cost (which favours its mass use compared to other sensors) and its low energy consumption (which allows it to be used in remote areas). However, it has two main drawbacks: low measurement accuracy and measurement error variability.

Competitive advantages

- Proven, functional method that reduces error by between 50 and 80% compared to the traditional calibration method.
- Easy to implement, capable of automation and easily applicable to any tipping-bucket device.
- Software developed and tested for easy compatibility with different platforms, so that corrections can be applied in almost real time.
- Method designed to increase the competitiveness of a type of rain gauge that in itself offers great competitive advantages over other alternatives, by overcoming its main drawback.

References

- Solution successfully tested and validated in laboratory conditions and in the field, in collaboration with the Spanish Geological and Mining Institute's risk management team, on 10 tipping-bucket rain gauges of two different models in a database with up to 13 years of records.

Protection

- Patent pending: P202030968

Stage of development

CONCEPT

RESEARCH

LAB PROTOTYPE

INDUSTRIAL PROTOTYPE

PRODUCTION

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