

Enhanced precipitation identifier and new generation of present weather sensor
Kurt Nemeth, OTT MESSTECHNIK GmbH & Co. KG
Ludwigstraße 16 D - 87437 Kempten, GERMANY

OTT PARSIVEL®: Laser-based optical Disdrometer for simultaneous measurement of **PAR**ticle **S**ize and **VEL**ocity of all liquid and solid precipitation

Extinction measuring principle

The new generation of enhanced precipitation identifier measures directly by patented extinction method and performs a reliable recognition of type of precipitation and various precipitation related data in all weather conditions and climate zones.

Precipitation

Measurements designed for determining the distribution and amount of precipitation can be carried out maintenance-free with Parsivel®, regardless of the intensity, duration or type of precipitation. Additionally, its composition – i. e. the distribution of particles with respect to their type – is obtained directly from the measured sizes and velocities of each single particle and is recorded statistically.

Present Weather Sensor (PWS)

The present weather and the types of precipitation (rain, drizzle, snow, hail and sleet) are classified in accordance with a weather code established by the WMO. Unmanned weather stations require automatic detection, reliably and unambiguously. Parsivel® can ascertain the type, quantity and composition of the hydrometeor and the atmospheric visibility – in every kind of weather!

Monitoring of disposal sites

The functions of precipitation kinetic energy distribution and precipitation measurement are utilised by Parsivel® to record the effect of rain on the condition of the disposal sites in conjunction with other sensors, e. g. ground-condition probes.

Monitoring road conditions

Local intense precipitation can lead to aquaplaning or packed snow on roads. Therefore, rapid traffic warning and control systems are necessary in order to prevent accidents. Precipitation measurement, hydrometeor composition and atmospheric visibility are of considerable importance in such systems. Parsivel® is an integrated instrument that measures all required parameters in accurate quality and performance.

Flood early warning

To assure a timely warning of impending high water it is necessary to measure the amount and spatial distribution of precipitation rapidly and accurately. This goal can be achieved by combining weather radar measurements (spatial information with reduced accuracy) and ground based disdrometer measurements: Parsivel® provides drop size distributions on the ground and a function to derive a local Z/R relation – ready to be used to adjust the radar data. In combination with water level sensors and drainage modelling, a high-performance regional flood early warning system can be erected.