

Assessing the metrological capabilities of Wind Doppler Lidars. Jean-Pierre Cariou, Ludovic Thobois, Rémy Parmentier, Matthieu Boquet and Sophie Loaec, Leosphere (France).

ABSTRACT

During the last 5 years, LEOSPHERE has developed and manufactured a full range of Windcube Doppler lidars for wind sensing. Applications include wind energy, site assessment, wind turbine verification and control, operational meteorology and airport hazard monitoring. All lidars use the same fiber laser technology at 1550nm in pulsed operation but vary by their laser power, telescope aperture, scanning possibilities and signal processing. Range is therefore between 200m for the smallest, and more than 10km for the most powerful.

So far, as more than 300 Windcube lidars have been manufactured and deployed all around the world, a full industrialization process has been setup in order to ensure the reliability of each unit and its specifications as well. Among all the functional specifications, those related to the metrological performances are the most important for the customers.

To assess the metrological performance of the instruments, different methodologies have been developed. Principal parameters that need to be validated are velocity accuracy, spatial resolution, range, distance accuracy, scanner angular accuracy and data availability. The presentation will present the definition of the parameters, the theoretical estimation of mean value and possible biases, and the validation methods used for wind profilers and scanning lidars, during internal or external test campaigns.