ICS 07.060
CCS A47

# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/T 44395-2024

## Technical specification for reliability evaluation of wind data from lidar

激光雷达测风数据可靠性评价技术规范

**Issued on: August 23, 2024** **Implemented on: August 23, 2024**

**Issued by: State Administration for Market Regulation;**
**Standardization Administration of the PRC**

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## Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Meteorological Administration. This document is under the jurisdiction of the National Technical Committee on Climate and Climate Change Standardization (SAC/TC 540). This document was drafted by: China Meteorological Science Academy, Guangdong Climate Center, Beijing Jiutian Meteorological Technology Co., Ltd., Shenzhen National Climate Observatory, Huayun Minstar Radar (Beijing) Co., Ltd., Beijing Guanxiang Optoelectronic Technology Co., Ltd., China Three Gorges New

Energy (Group Group) Co., Ltd., Huafeng Meteorological Media Group Co., Ltd., and Beijing Global Weather Navigation Technology Co., Ltd. The main drafters of this document are. Song Lili, Chen Wenchao, Quan Lihong, Wang Binglan, Zhi Shiqun, Yuan Chunhong, Zhang Yongshan, Xiao Qingyao, Wang Xiangyun, Gao Ruiquan, Shu Shijiang, Sun Jian, Wang Shangkun, Wang Ruiming, Zhang Jili, and Xue Yangyang. Technical specification for reliability evaluation of lidar wind measurement data

## 1 Scope

GB/T 44395-2024 sets the Chinese technical specification for evaluating the reliability of wind data measured by lidar. Wind lidar has largely replaced the met mast in wind resource assessment because it is cheaper, movable and can reach modern hub heights, but a wind farm is financed on the resource estimate, so the question of whether a lidar dataset can be trusted is a financial one. The standard sets the evaluation content and process: the requirements on the instrument and its calibration and verification against a reference, the siting and installation conditions and the terrain and flow distortion effects that bias a profiling lidar, the data availability and the treatment of gaps, the quality control filters and the flags applied, the statistical comparison against a reference where one exists including the regression, correlation and uncertainty analysis, the assessment of the data for consistency and for drift over the campaign, and the grading of the dataset and the report. It took effect on 23 August 2024.

This document specifies the general requirements for parallel comparison tests using cup anemometer data mounted on a wind tower and lidar data. The requirements, parameters and indicators are given, and the corresponding evaluation methods and reliability evaluation are described. This document is applicable to the parallel comparison of laser radar and cup anemometer installed on wind tower at observation height below 400 m. Data reliability evaluation work.

## 2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies. in this document.

GB/T 18709-2002 Wind energy resource measurement method for wind farms QX/T 449-2018 Climate feasibility demonstration specification field observation

## 3 Terms and definitions

The following terms and definitions apply to this document. 3.1 (Wind measurement) Lidar

The laser is used as a light source to emit a laser beam into the atmosphere and receive the backscattered signal of the atmospheric particles. The received echo is analyzed relative to the emitted echo. Laser wind measuring equipment that uses the Doppler frequency shift of emitted lasers to invert wind speed and direction.

3.2 data reliability The ability of an instrument to measure data that meets specified requirements under specified conditions and within a specified time.

3.3 Wind measurement tower A tall, mast-like structure used to mount wind sensors, data logging equipment, and power and communications equipment. [Source: GB/T 37523-2019, 3.1, modified]

3.4 Average wind speed The arithmetic mean of wind speed records over a given period of time. [Source: GB/T 18710-2002, 3.6, modified]

3.5 gust velocity Instantaneous wind speed value with a time interval of 1 s to 3 s. [Source: QX/T 436-2018, 3.9, modified]