

Brief Introduction of Leice's Applications in Smart Wind Power

Qingdao Leice Transient Technology CO.,Ltd
Ocean University of China
June 2023

About Us



Qingdao Leice Transient Technology Co., Ltd. was jointly initiated and established by scientific research and engineering experts from Ocean University of China and AIOFM, CAS. LEICE focuses on the research and development, manufacturing, and sales of atmospheric and oceanic LiDARs. The equipment is widely adopted in environmental meteorological 3D monitoring, smart wind power, aviation and civil defense.

- **Over 30yrs technology background:** engaged in active laser remote sensing technology and product research and development since 1990s.
- **Over 70%** of employees have a master's or doctoral degree, providing professional and international service.



中国海洋大学



Our History



1990s, developed the first Doppler Lidar in China



1999, Academician Wang Daheng, "Father of Chinese Optics"



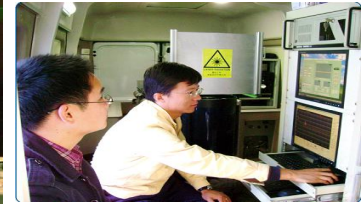
2000, talent exchange with NOAA/NASA in USA



2002, talent exchange with Germany DLR



2005, developed the first mobile wind Lidar system in China



2008, meteo support for Qingdao Olympic Sailing Competition



2008, support the manned space recovery and support mission of "Shenzhou-7"



2009, developed the first incoherent Doppler Wind Lidar



In 2010, developed China's first airborne ocean lidar



2012, developed the first coherent Doppler Wind Lidar



2013, developed the first shipborne wind Lidar



2014, developed China's first airborne wind Lidar



2014-2018, completing the industrialization and product replacement of LiDAR in China

- Founded by scientific research and engineering experts from Ocean University of China. **Over 30yrs technology background:** engaged in active laser remote sensing technology and product research and development since 1990s.

Our Product family

Floating Buoy Wind Lidar
WindMast 350-MB



3D Scanning Wind Lidar
Wind3D 10K



3D Scanning Wind Lidar
Wind3D 6000



Super Mini Wind Lidar



Vertical Wind Lidar
WindMast WP350



Nacelle Wind Lidar
WindHorizon H400



Boundary Layer Wind Lidar
WindMast PBL



Raman Temperature and Humidity Lidar
WATCL 15K



Airborne Wind Lidar
WindMast AB3000

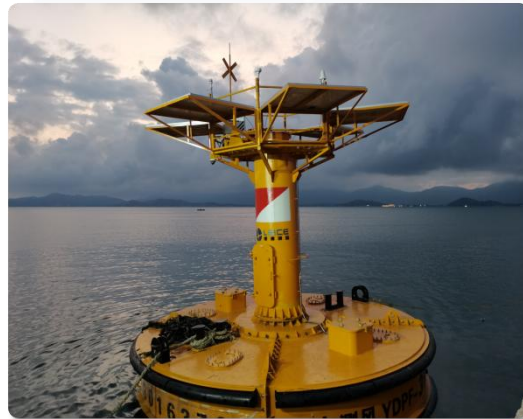
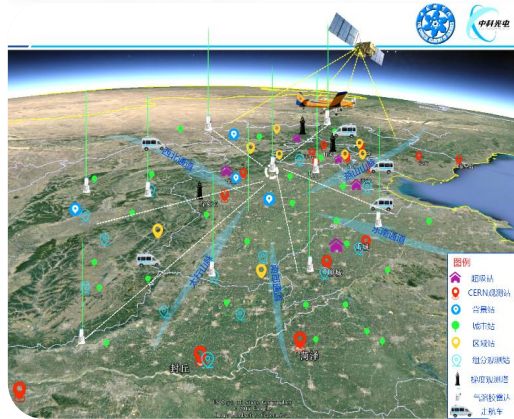


CO₂ /CH₄
Gas Flux Lidar



Application Area

Environment & Meteorology, Smart Wind Power, Aviation Safety & Efficiency



Certified and Bankable Data

Type-specific Classification

Report RSV19018.A1
Calibration Test of WindMast WP350, Georgsfeld

DEUTSCHE
WINDGUARD

Validated by Germany WindGuard and DNV_GL, OWA stage 2

Calibrated in CMA by comparison with radiosonde, L-band radar, Raman radar

Calibration Test of WindMast WP350

Site: Georgsfeld (Germany)

Customer: Qingdao Leice Transient Technology Co., Ltd.
Nr. 169, Songling Road, Laoshan Distric



WINDHORIZON H400
Independent performance verification of a 4-beam WindHorizon H400 at DNV GL test site in Janneby, Germany

QINGDAO LEICE TRANSIENT TECHNOLOGY CO. LTD.

Report No.: 10158479-R-2, Rev. A
Date: 2020-06-11



LEICE WINDMAST WP350-WP014
Classification and performance related assessment of a Leice Windmast WP350 LiDAR at the Haiyang Remote Sensing Test Site

Qingdao Leice Transient Technology Co., Ltd.,

Report No.: 10312534-R-01-A
Date: 2021-11-17



TYPE WP350 LIDAR
Remote Sensing Device Type-specific Classification Summary

Qingdao Leice Transient Technology Co., Ltd

Report No.: 10312534-R-04-A
Date: 2023-05-19
QL



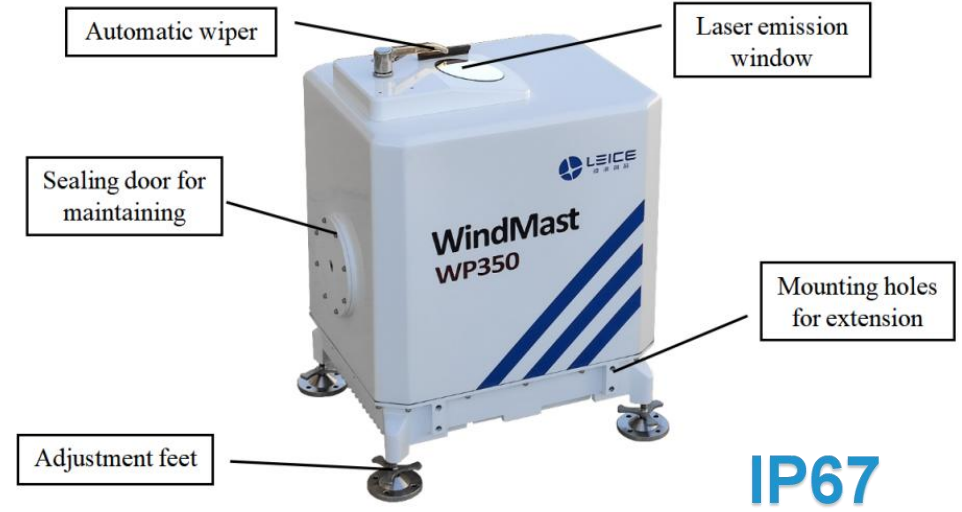
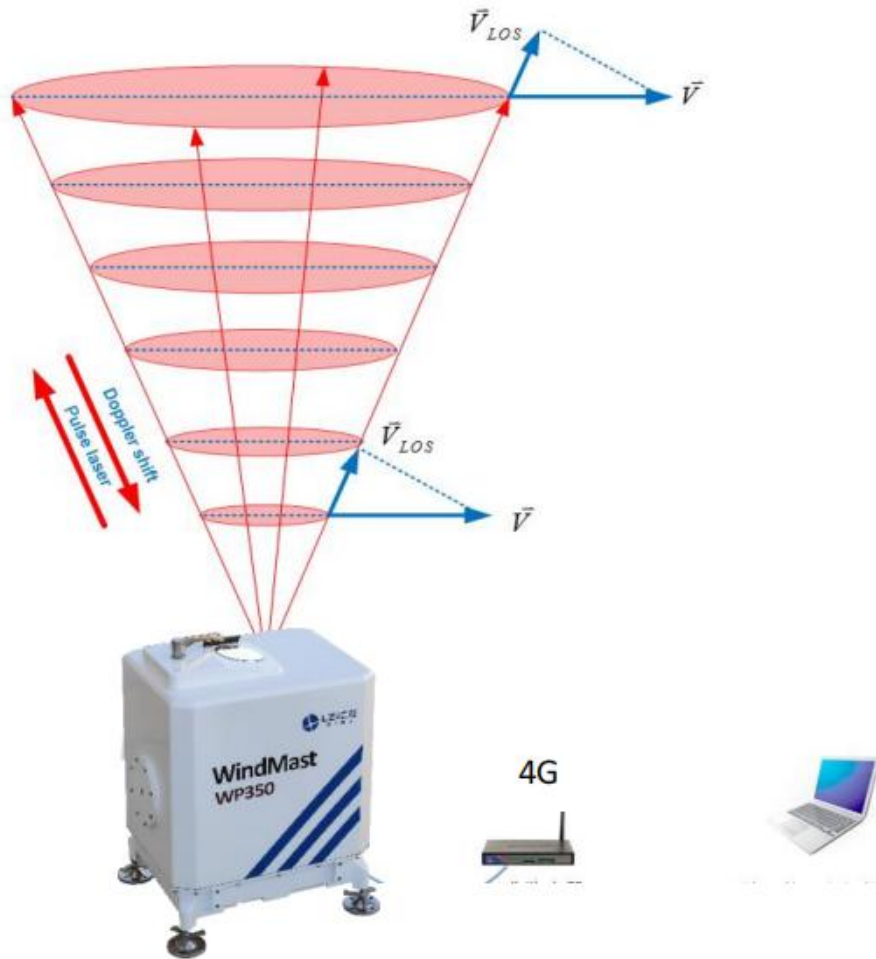
LEICE WIND3D 10K SN 3D10K018
Independent performance verification of a Leice Wind3D 10K Lidar at the Haiyang Remote Sensing Test Site

Qingdao Leice Transient Technology Co., Ltd.

Report No.: 10296167-SHA-R-02, Rev. B
Date: 2021-06-17



Vertical Wind Lidar - WP350



IP67

NO	Specifications	Parameters
1	Measurement height	40m ~ 350m
2	Range resolution	40m ~ 350m (24 gates), min resolution 1m
3	Laser wavelength	1550nm, invisible and eye safe
4	Data refresh rate	1s/1min/2min/5min/10min (configurable)
5	Wind velocity range	0 ~ 75m/s
6	Wind velocity accuracy	≤ 0.1 m/s
7	Wind direction accuracy	$< 3^\circ$ (average wind speed > 2 m/s)
8	Scanning modes	Multi-beam / VAD
9	Weight	< 30 kg
10	Size (L*W*H)	420*300*460mm
11	Average power	< 80 W

Scanning Wind Lidar - Wind3D



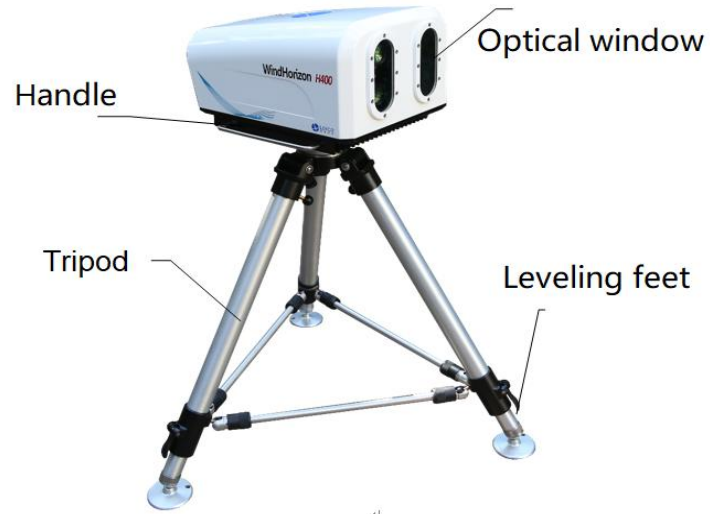
- **IP66** waterproof and dustproof
- **Min. spatial resolution 15m**
- Dual scanning probe - **3D camera**

Highly integrated, Small in size, Light in weight

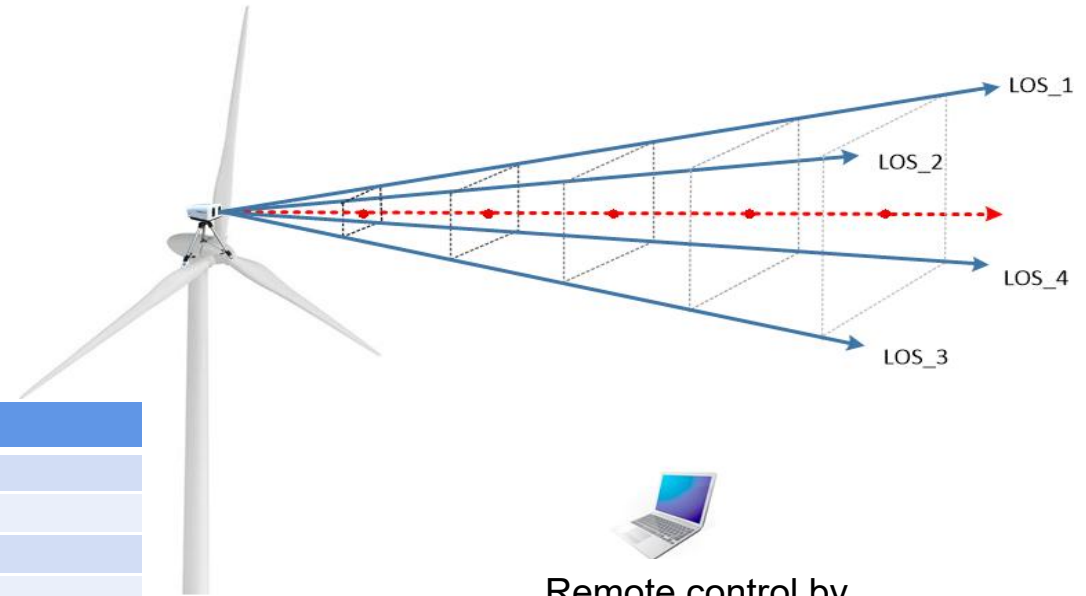
630×740×1070mm, <130kgs

NO	Specifications	Parameters
1	Radial detection range	45m ~ 6000m / 60m~12km
2	Radial distance resolution	15m/30m/60m/ user defined
6	Data refresh rate	1Hz ~ 10Hz (programmable)
7	Radial wind velocity range	-37.5 ~ +37.5 m/s
8	Wind direction range	0 ~ 360°
9	Wind velocity accuracy	≤0.1m/s
10	Wind direction accuracy	< 3°
11	Scanning modes	LOS/DBS/VAD/PPI/RHI/CA PPI script programmable
12	Servo scanning range	Horizontal: 0 ~ 360°, Vertical: -90 ~ +270°
13	Servo pointing accuracy	0.1°
14	Scanning speed	55°/s (max)
11	Weight	< 130kg

Nacelle Wind Lidar - H400



Control box - Installed in turbine engine



Remote control by WiFi connection

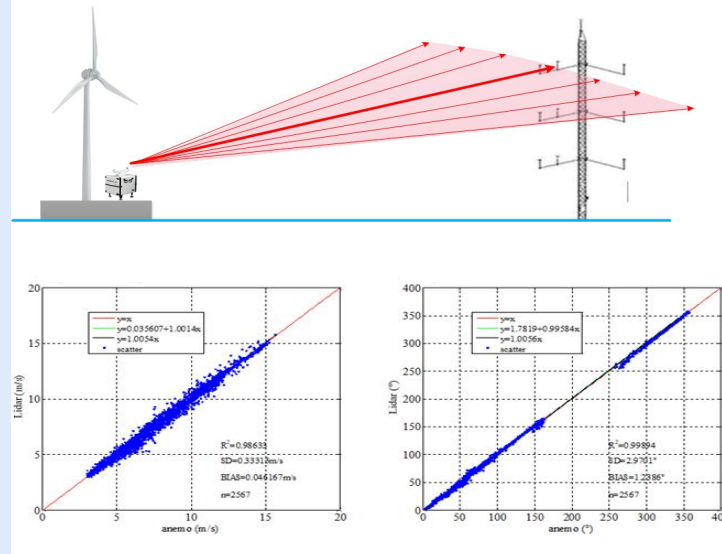
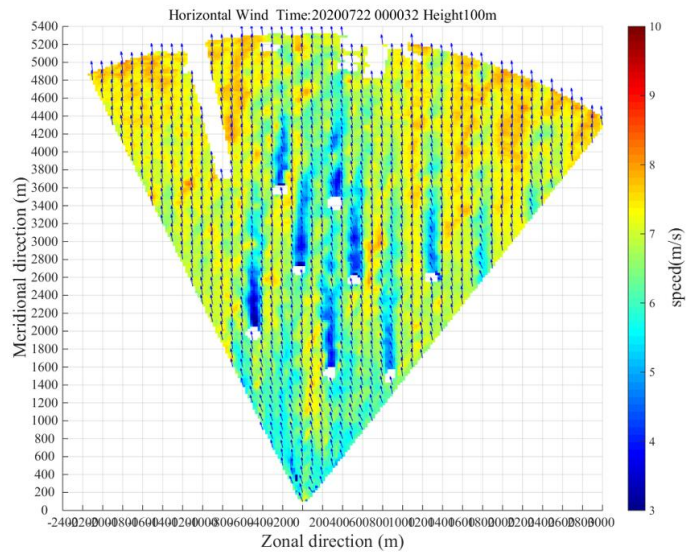
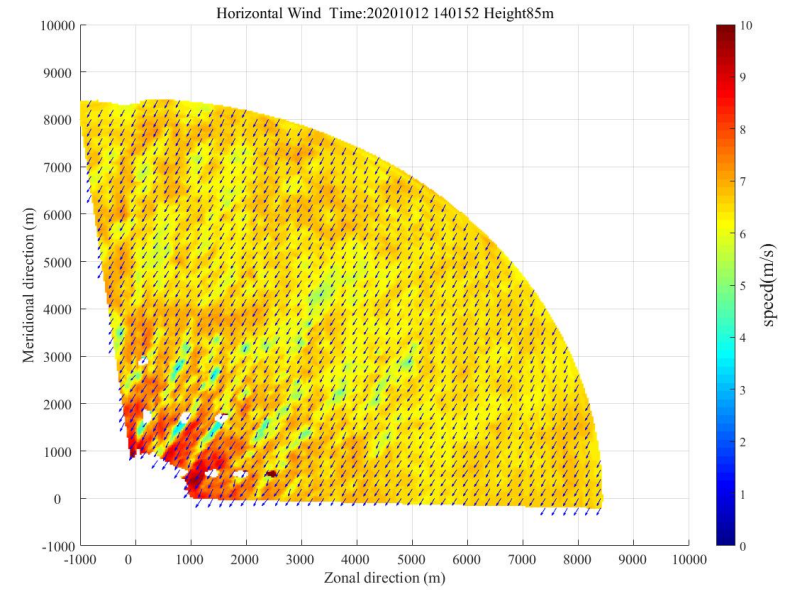
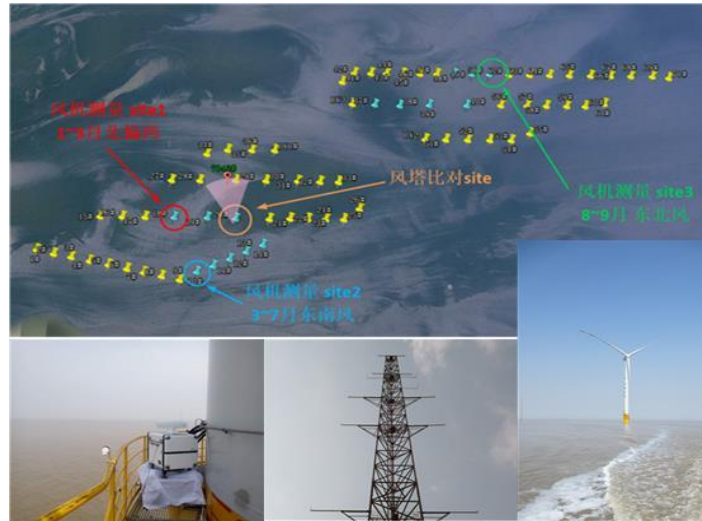
NO	Specifications	Parameters
1	Detection range	50m ~ 400m
3	Data refresh rate	1Hz ~ 4Hz (programmable)
4	Range gates	10 gates, configurable (1m resolution)
5	Wind velocity measurement range	0m/s ~ 70m/s
6	Wind velocity accuracy	$\leq 0.1\text{m/s}$
7	Wind direction accuracy	$< 0.5^\circ$
8	Beam number	4 beams
9	Data output	Radial wind speed, pitch angle and roll angle, 1 s / 10 min horizontal wind speed and direction sequence of hub height, horizontal and vertical wind shear, turbulence intensity, signal-to-noise ratio, data acquisition rate, etc
10	Data storage	csv format, 1 year storage data

Offshore Floating Lidar System

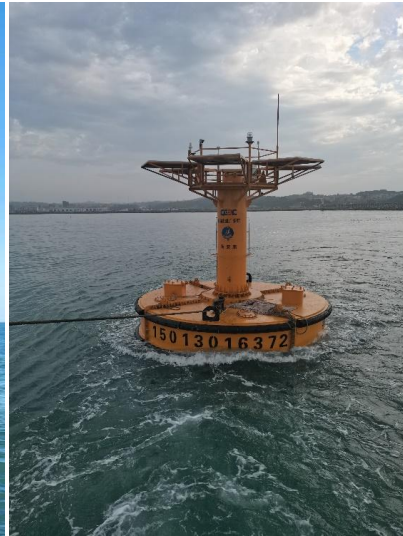
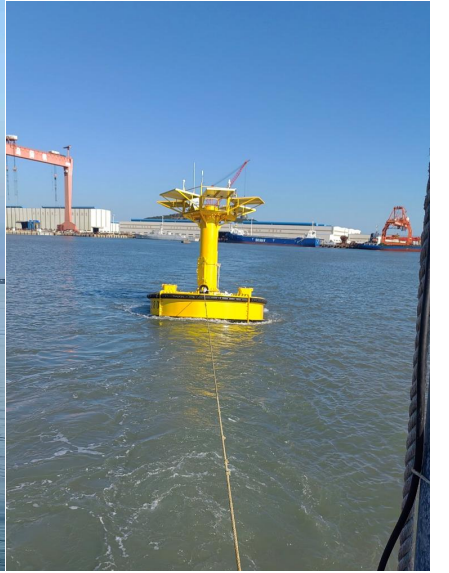
- Large scale buoy is suitable for the sea conditions of many areas;
- Wind resource measurement in deep water area;
- Solar cell + battery, successfully solves the data measurement reliability of floating lidar;
- The correction algorithm of lidar on dynamic platform has been verified;
- It can measure the ocean condition synchronously.



Deployments of Scanning Lidars



Deployments in offshore sites



Deployments in other Areas



Besides Chinese market, Leica also went abroad with deployments in South Korea, Thailand, Mongolia, Austria, Germany, Slovenia...

Thank you for your attention !

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