

Accuracy of ZX300e wind direction measurements

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ZX Lidars

ZX 300e is a newly-developed wind lidar profiler, with improved performance compared to ZX 300, which has itself been used for many years in many resource assessment campaigns across the world.

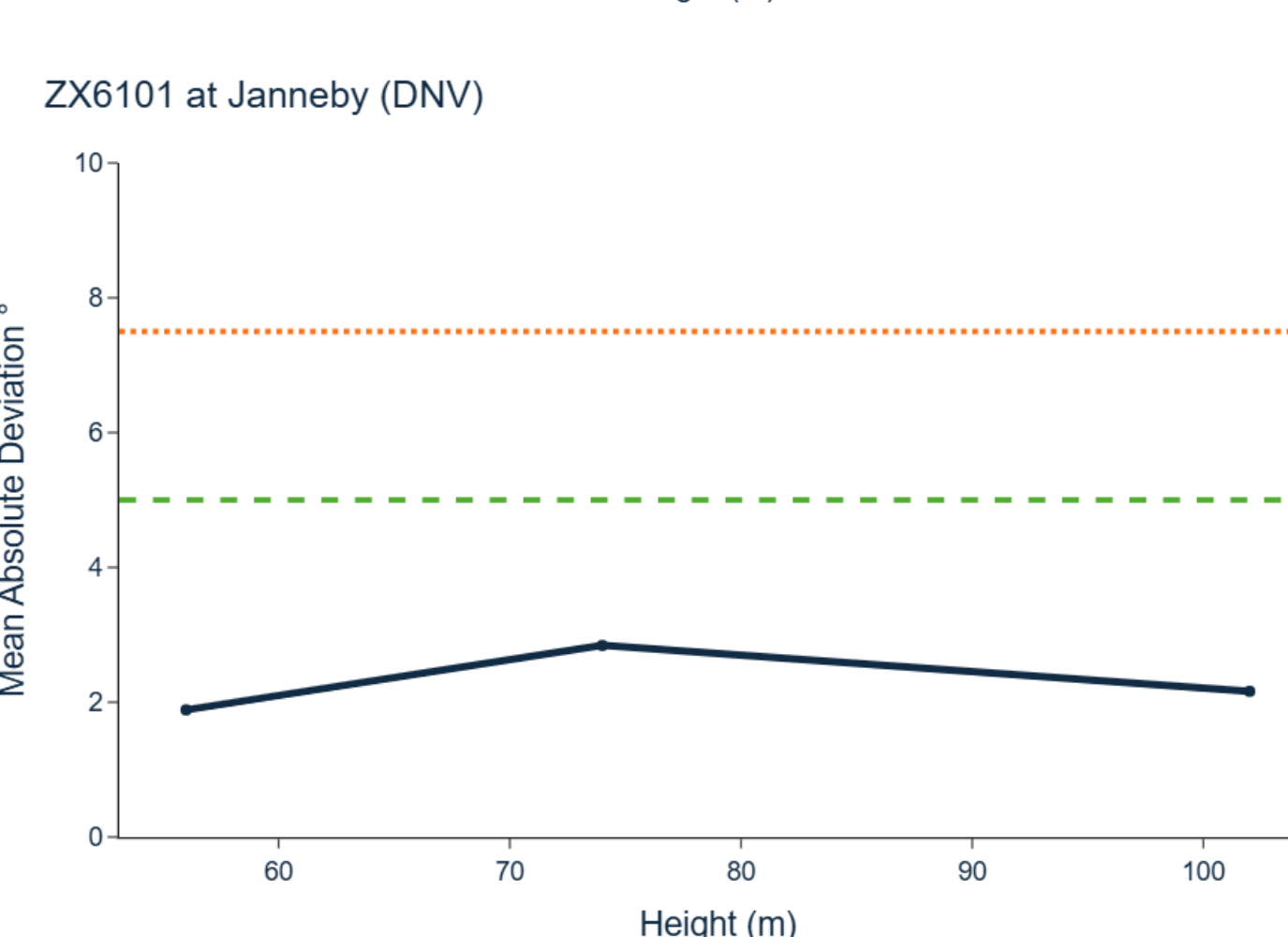
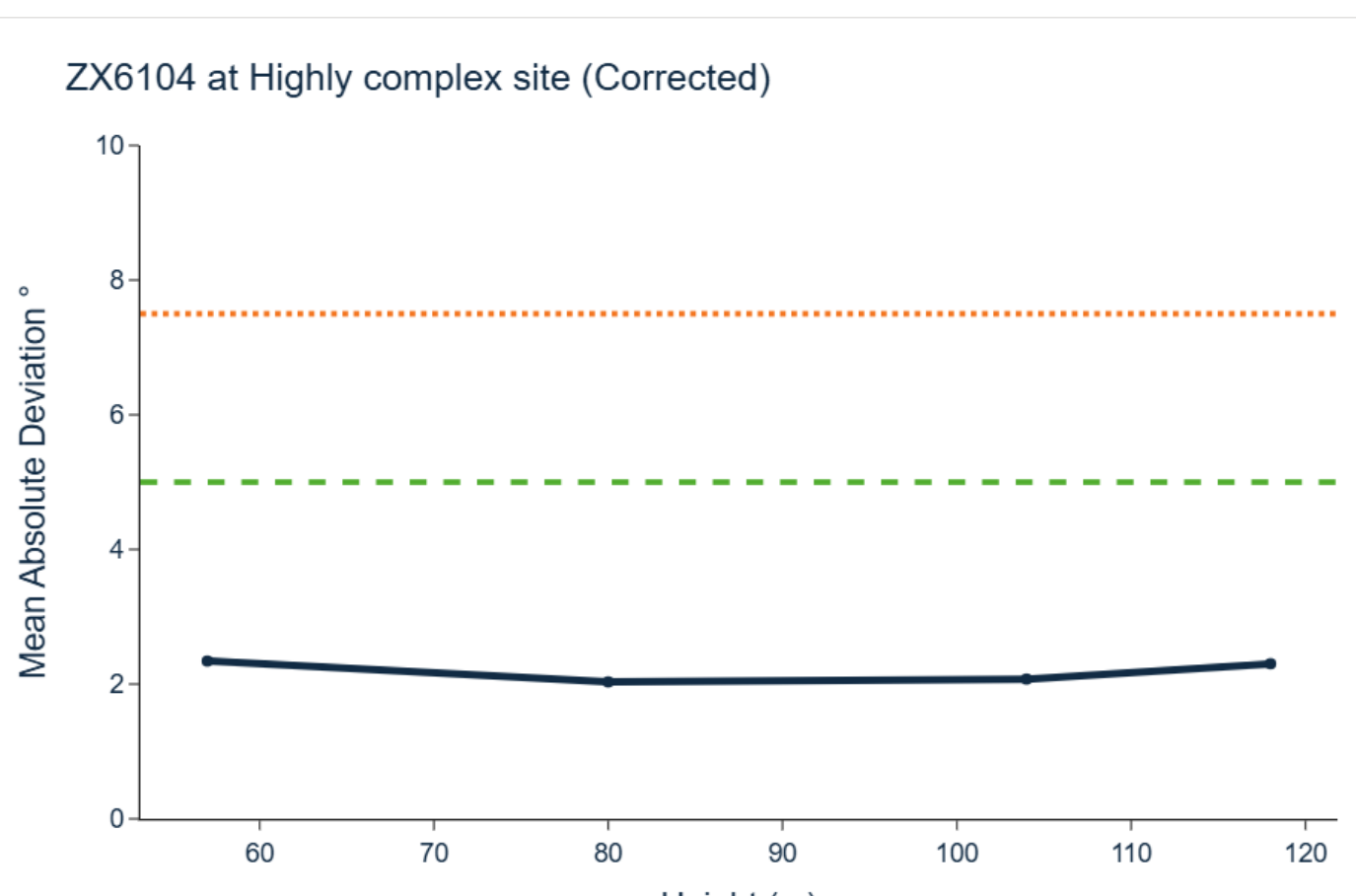
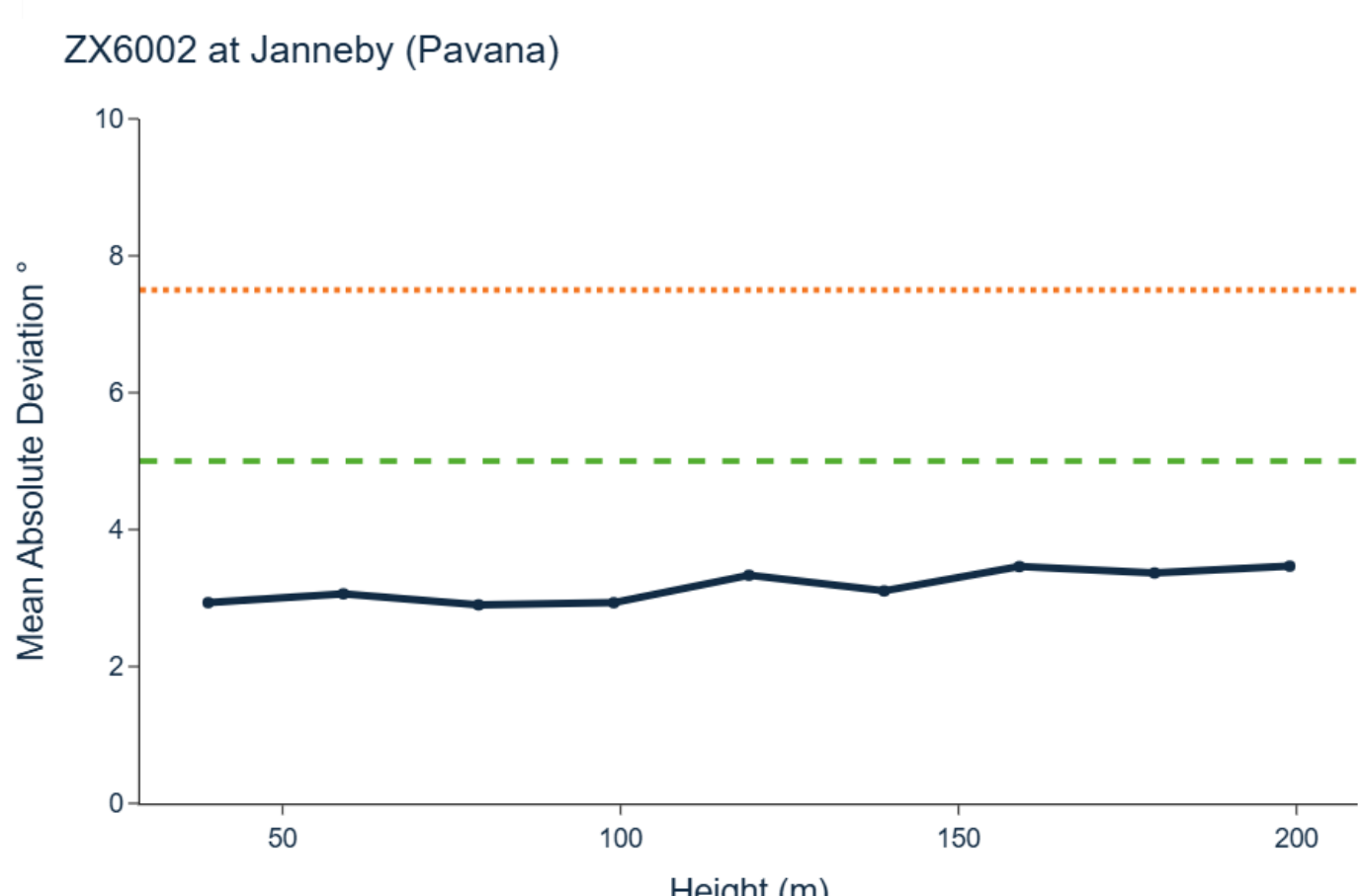
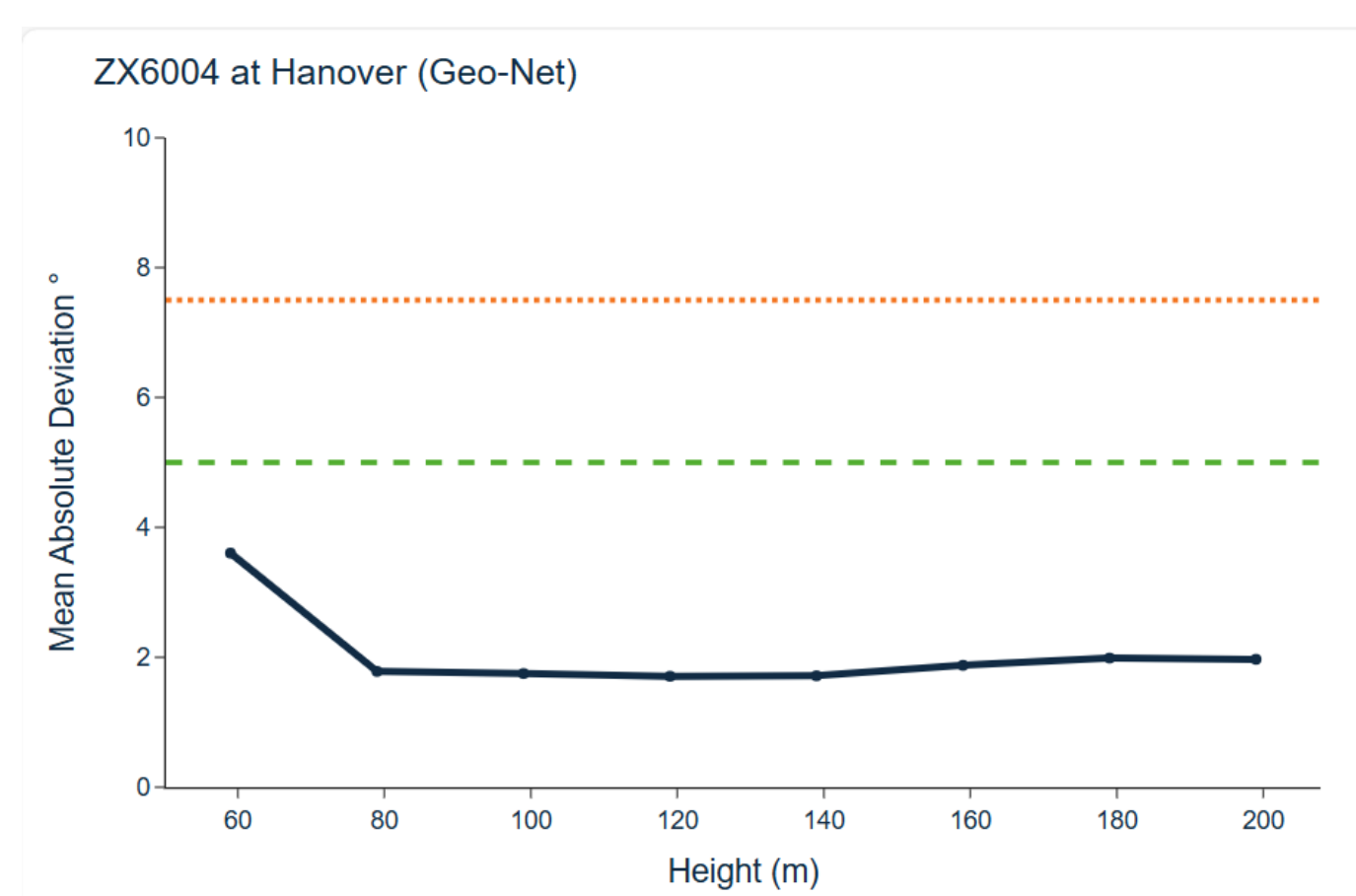
Under highly controlled in-house conditions, the wind direction accuracy of a ZX 300e lidar was determined to be +/- 0.5 degrees.

Multiple lidars were deployed for verification at multiple sites and under different weather conditions and the mean absolute deviations from the reference measurements were within the Wind Industry Best Practice Acceptance criteria.

This high measurement accuracy facilitates the use of ZX 300e lidars in a wide range of applications such as wind-assisted propulsion systems, wind farm layout management as well as aircraft launching and landing.

- Under controlled conditions, the wind direction measured by a ZX 300e lidar is accurate to within 0.5 degrees.
- In the field, alignment errors as well as variations in the wind flow sampled by the lidar and the reference can influence the accuracy of lidar measurements of direction.
- The mean absolute deviation of the lidar 10-minute wind directions from the reference measurement was used to quantify the direction accuracy.

- A fleet of ZX 300e lidars was deployed at the UK Remote Sensing Site (ZX, DNV).
- To demonstrate the consistency of the wind direction measurements across multiple lidars, the mean absolute deviations were compared across the fleet.
- These results are also illustrated graphically with wind roses at the three mast heights equipped with vanes and/or sonics.



• For multiple ZX 300e deployments on multiple sites, including Hanover (GEO-NET), Janneby (Pavana and DNV) and a highly complex site, for a period of about three months, the mean absolute deviations meet the Wind Industry Best Practice Acceptance criteria.

• This deviation accounts for contributing factors such as lidar alignment and mast calibration errors and flow non-homogeneity across the scan.

• For a fleet of lidars deployed concurrently mean absolute deviation deviations within 2 degrees of one another were observed.

• All lidars met Wind Industry Best Practice.

• This demonstrates the high degree of accuracy of the ZX 300e wind direction measurements [1].

[1] ZX 300e Introduction and Performance Credentials, 24 Sept. 2025

