Investigation Details
The German “Technical Guideline TR6” requires the application of correction methods in complex terrain and the introduction of an additional uncertainty of half of the correction value in an energy yield expertise. The aim of this study is to test the performance of the standard tools to estimate the magnitude of possible differences, corrections and uncertainties and to understand the mechanisms behind these effects.

Abstract
The application of LiDAR measurements in complex terrain is influenced by volume effects caused by non homogeneous wind flow. This effect on derived wind speeds can be assessed and corrected by different methods:

- **Online methods** like the FCR (Flow Complexity Recognition) implemented in the WindCube v2 software can directly calculate corrected speed values. This method works completely automatic.

- **Offline methods** get correction factors from flow field variables of a CFD model like WindSim and apply them to the data later on. This method is dependent on the quality and parameter settings of the CFD.

Objectives
The German “Technical Guideline TR6” requires the application of correction methods in complex terrain and the introduction of an additional uncertainty of half of the correction value in an energy yield expertise. The aim of this study is to test the performance of the standard tools to estimate the magnitude of possible differences, corrections and uncertainties and to understand the mechanisms behind these effects.

Methods and Results
From a wide range of sites we present examples of four sites with different complexity and direction offset in LiDAR mounting.

Model Resolution and Parameters
Good horizontal resolution (normal vs. fine) has more impact on output quality than the increase of modelling sectors. Forest parametrization and stability parameters that reduce vertical motion and were often helpful in improving the models in terms of profile fitting on the other hand seem to decline the quality of CFD corrections.

Conclusions
- Although doing a good job at some sites, corrections do not improve Mast-LiDAR difference in every case and results differ for the same site and different methods.
- For both methods it is not recommended to use them without carefully cross checking the results with mast measurement on their reliability.
- Further studies can help to understand these effects better and improve the correct application.

- Correction of LiDAR remote sensing measurements by CFD simulations.
  Dr. C. Meissner, WindSim AS, LEOSPHERE SAS, EWEA 2011 poster presentation.
- Cartography of WINDCUBE v2 performances with FCR – A case study in Europe
  R. Krishnamurthy, M. Boquet, LEOSPHERE SAS, France, EWEA-2015 Poster Presentation.

PO.185
Added value of LiDAR correction methods from a user’s perspective
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Diurnal Cycle of Mast-LiDAR difference and standard deviation of w

Model Resolution and Parameters

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