Windcube + FCR test at Hrgud, Bosnia and Herzegovina - DTU Orbit (18/08/2019)

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Velocity azimuth display (VAD) scanning lidars cannot measure the wind speed accurately in complex terrain because the fundamental assumption that the wind speed is horizontally homogeneous is violated. Leosphere provides an online correction, the Flow Complexity Recognition (FCR), in order to correct the effect of the terrain on the Windcube measurements. The aim of this project was to assess the accuracy of this correction by comparing the corrected lidar measurements to the uncorrected measurements and to simultaneous measurements taken by cup anemometers on a met mast. The measurements took place in a complex site, Hrgud, in Bosnia and Herzegovina, provided by ERS and where the reference met mast was erected and instrumented by COWI. The lidar uncorrected wind speed was lower than that measured by the cup anemometer at the same height by about 4.1%. This deviation is sensitive to the wind direction and depends on the topography. The largest deviations were observed in the direction orthogonal to the hill on which the lidar and the mast were located, which is where the topography is the less homogeneous. The FCR corrected wind speed on the other hand was higher than the cup anemometer by about 1.5%; but this deviation was fairly independent from the wind direction. This measurement campaign also highlighted a couple of important technical points, such as the importance of well protecting the lidar power supply in order to avoid any damage of the instruments, due to lightning hits for example.

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