Karlsruhe Institute of Technology

SCREEN CAPTURE WELCOME

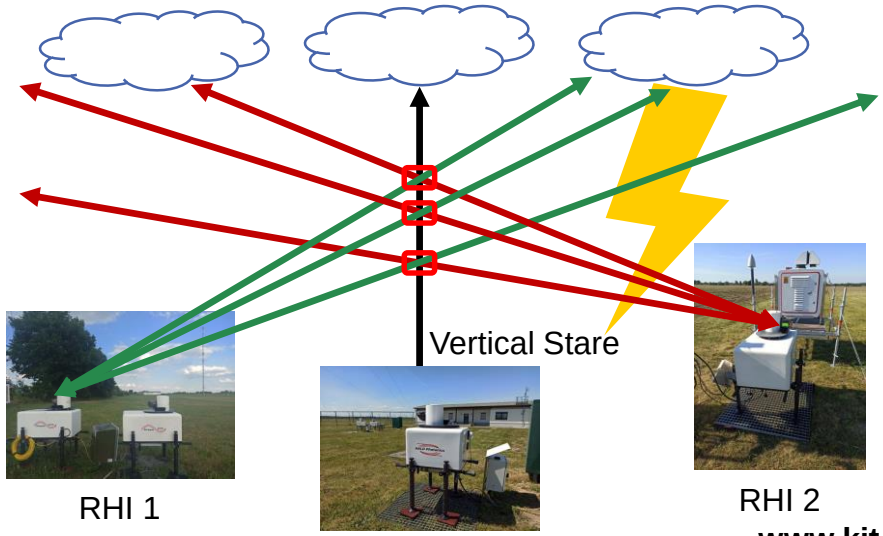
DWD

KIT-Campus Alpin
IMK-IFU: Atmospheric Environmental Research

Can Lidars compete with sonic anemometers? – Comparison of wind measurements from different Doppler Lidar scan strategies to sonic anemometer data – Display material

Kevin Wolz, Frank Beyrich, Julian Steinheuer, Carola Detring, Ronny Leinweber, and Matthias Mauder





Quality control

First MAD (Mauder et al., 2013)

- Filter applied on raw data

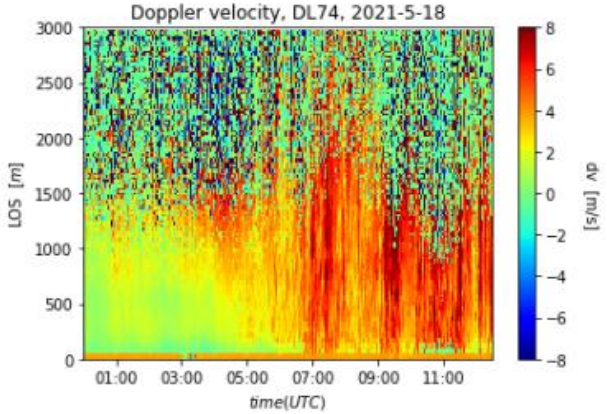
$$\langle \chi \rangle - \frac{q * MAD}{0.6745} \leq \chi_i \leq \langle \chi \rangle + \frac{q * MAD}{0.6745}$$

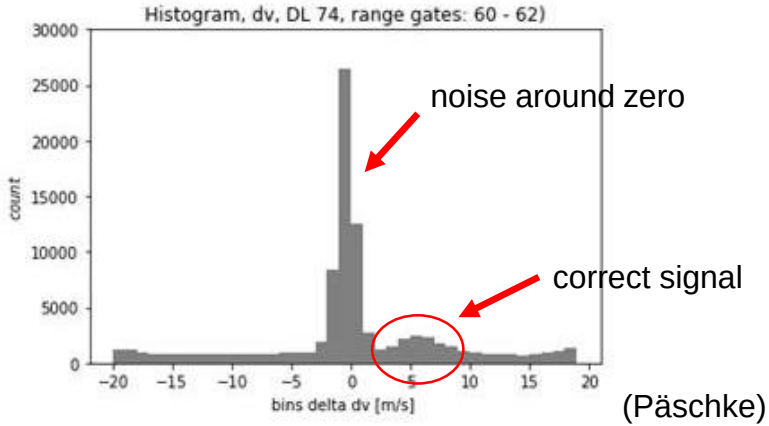
- $\langle \chi \rangle$ Median of *x*
- q Threshold value
- *MAD* Median absolute deviation = $\langle |x_i - \langle x \rangle| \rangle$

Quality control

Test for unimodality

- Diptest after Hartigan & Hartigan (1985)
- To check for potential problems in MAD tests with noise around zero
- Using R-Package “diptest” by Martin Maechler



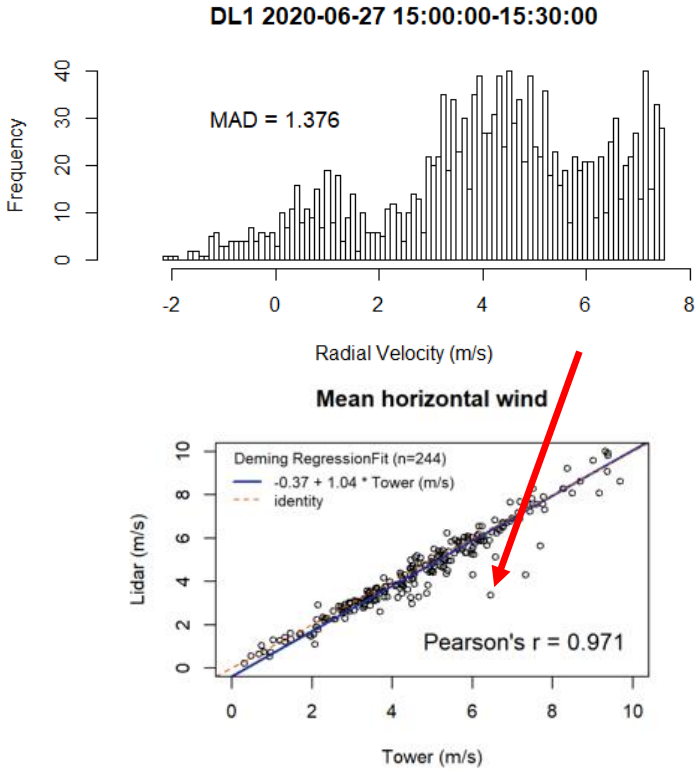


(Päschke)

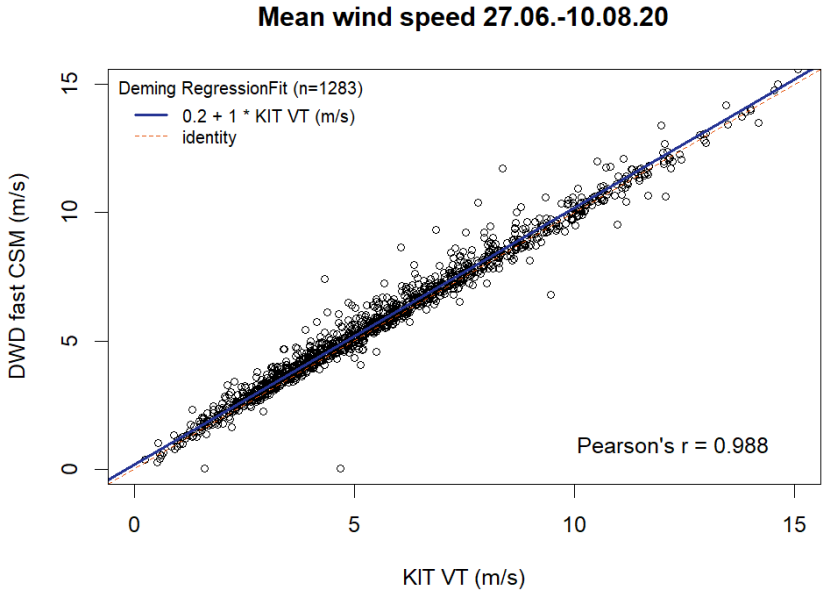
Quality control

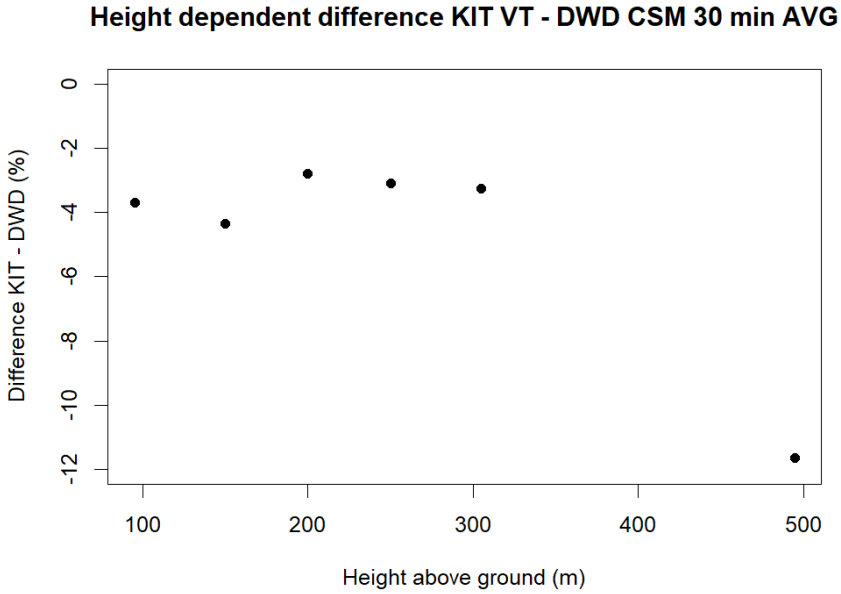
Hard MAD threshold

- Filter if MAD > 1.1 m s^{-1}
- after Papale et al. (2006)
- Filter applied on the averaged data
- Problems occurred whenever MAD was high

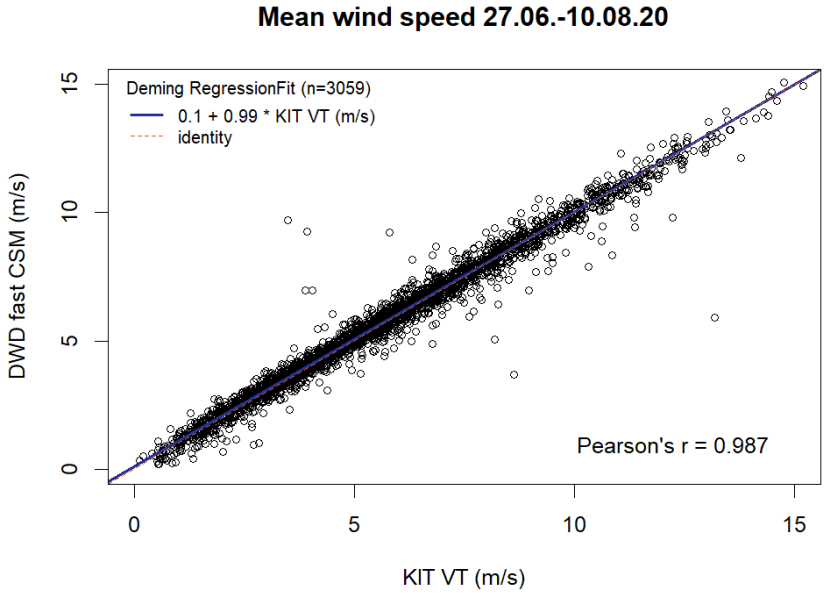


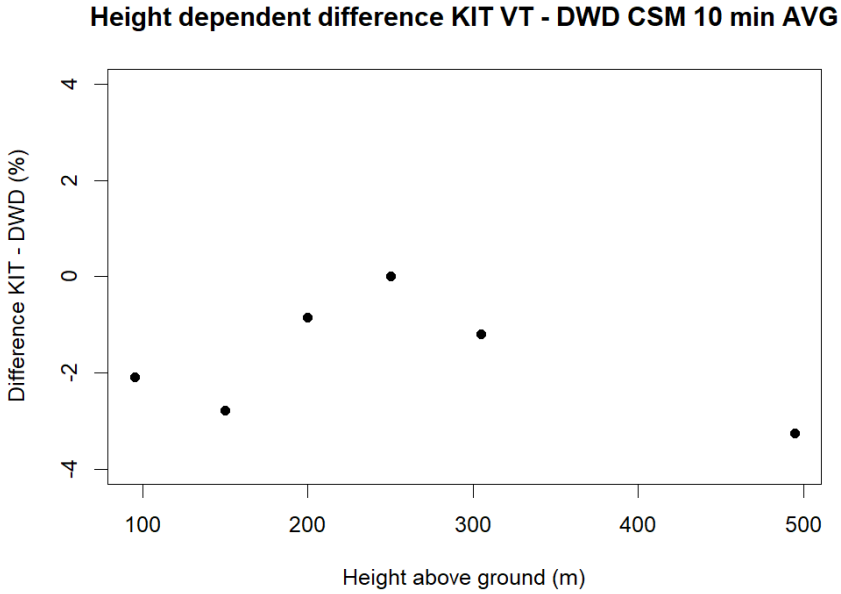
Comparison KIT VT Step/stare with DWD single Lidar fast CSM 30 min AVG



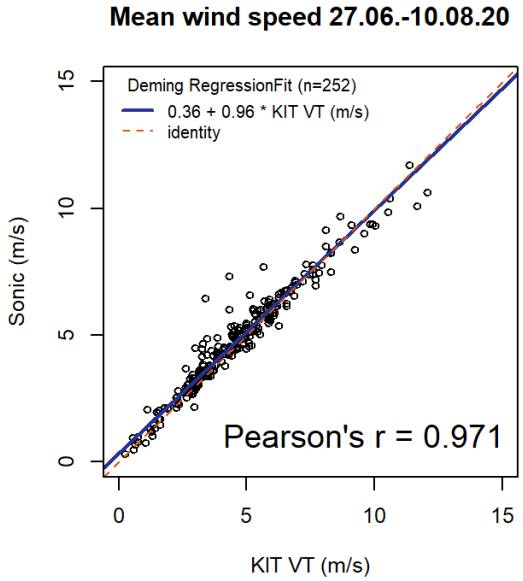


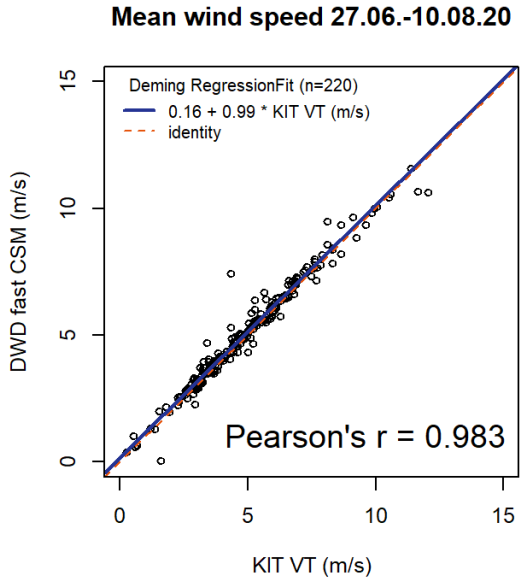
Comparison KIT VT Step/stare with DWD single Lidar fast CSM 10 min AVG

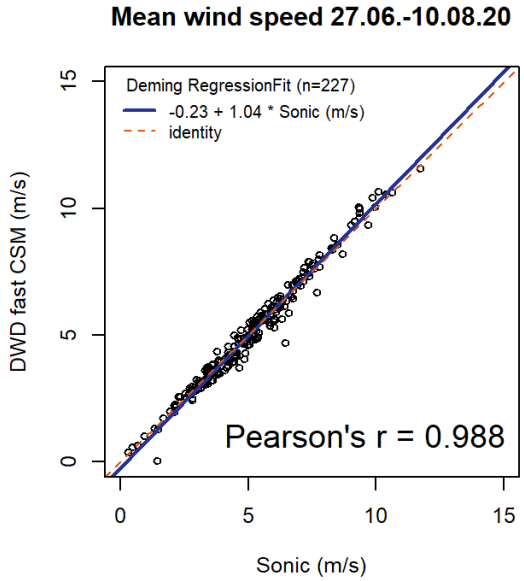




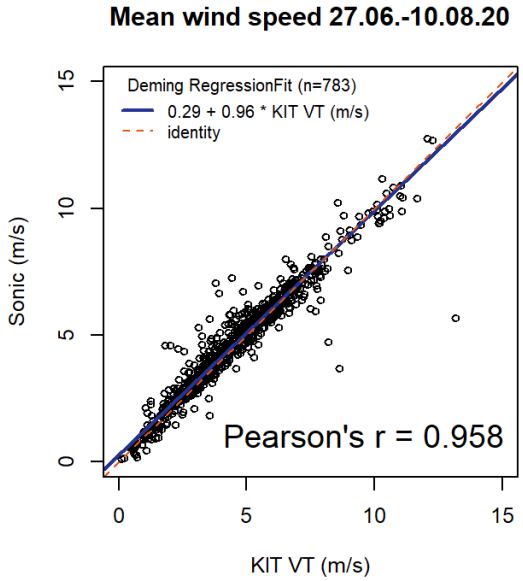
Regression KIT Step/stare – DWD single Lidar fast CSM - Sonic anemometer 30 min AVG

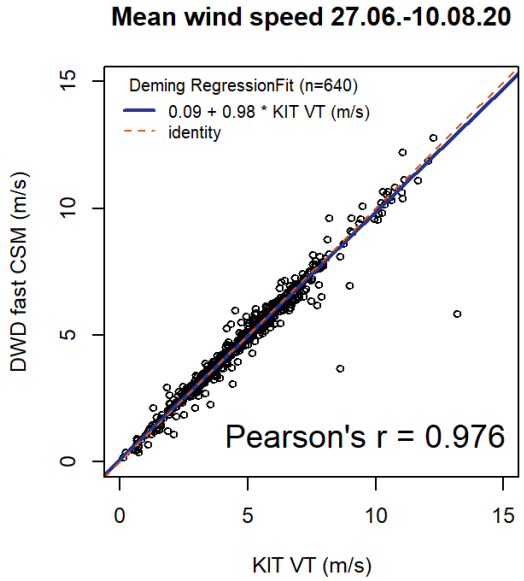


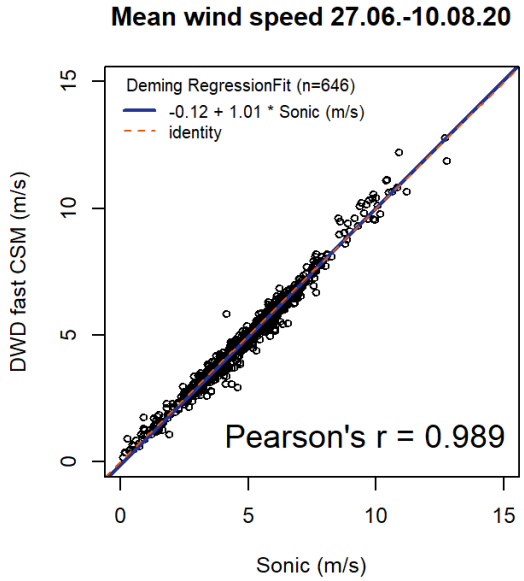




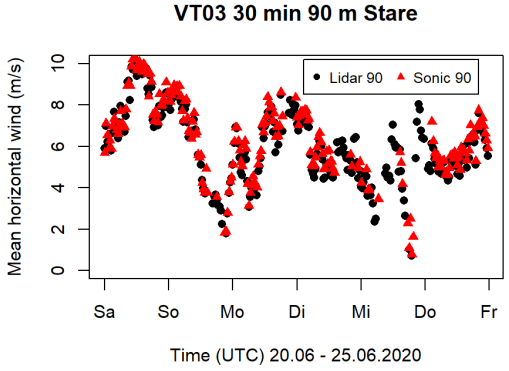
Regression KIT Step/stare – DWD single Lidar fast CSM - Sonic anemometer 10 min AVG

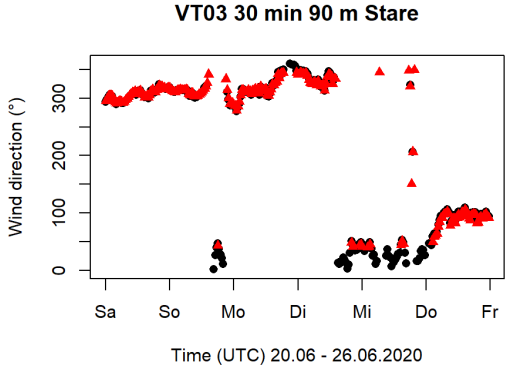


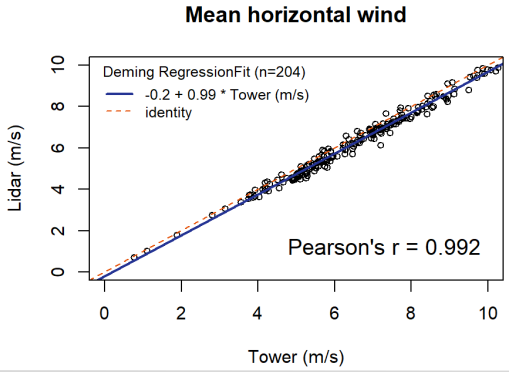


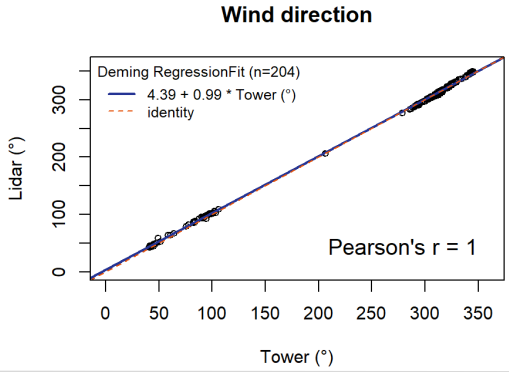


Comparison KIT 90 m Stare – Sonic anemometer 30 min AVG

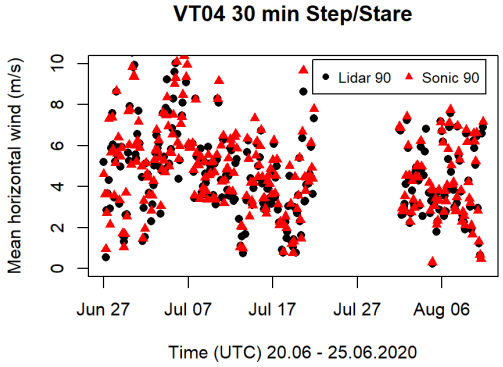


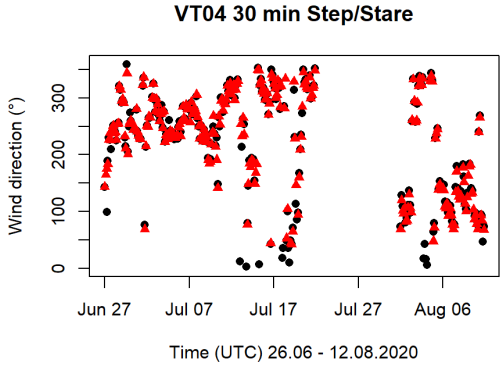


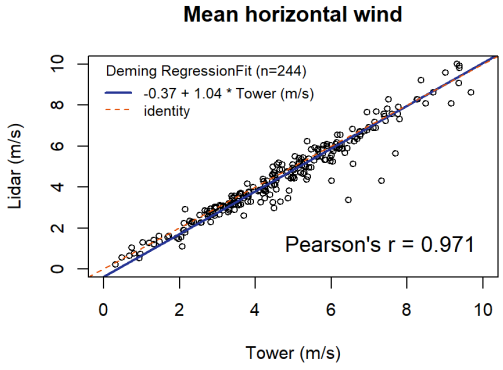


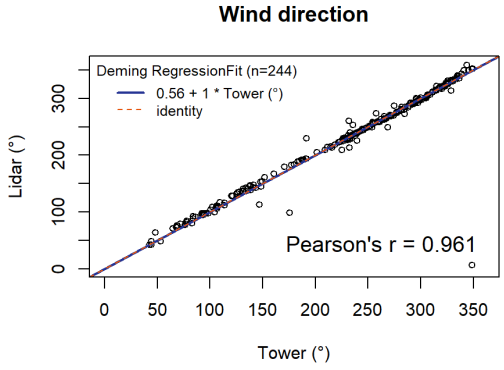


Comparison KIT Step/stare – Sonic anemometer 30 min AVG

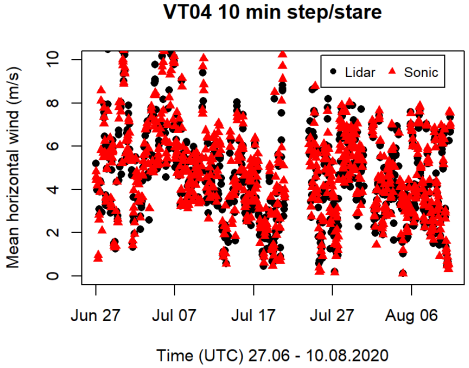


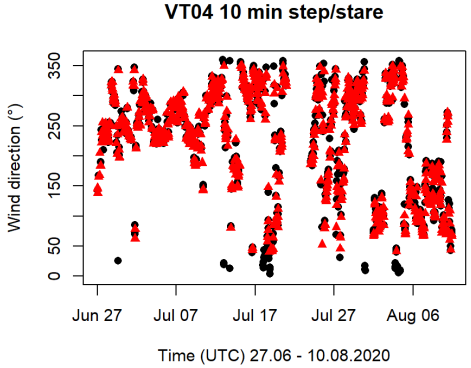


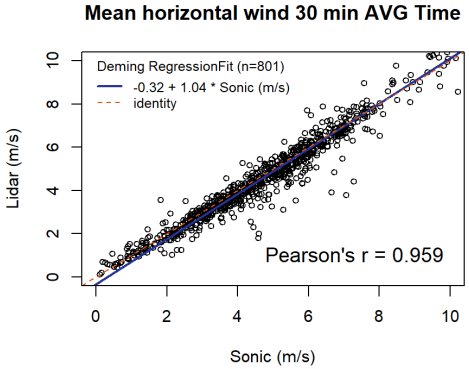


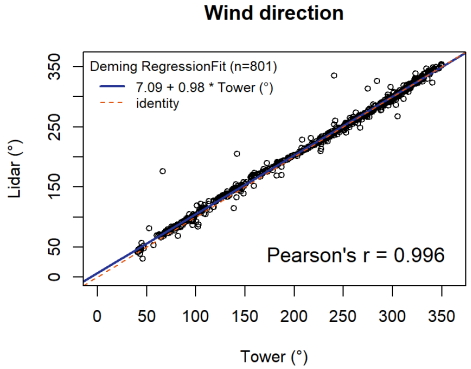


Comparison KIT Step/stare – Sonic anemometer 10 min AVG

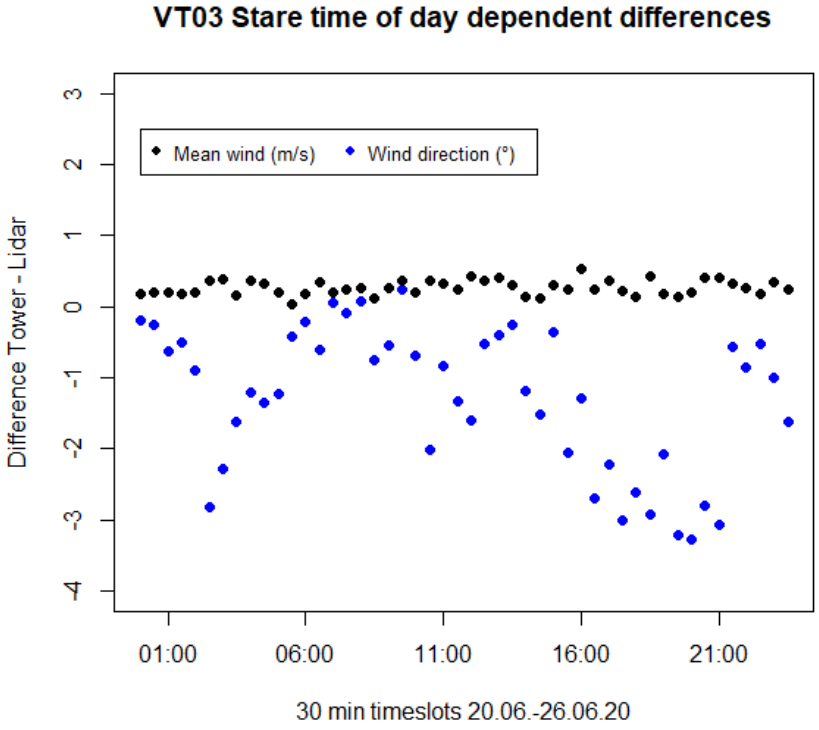




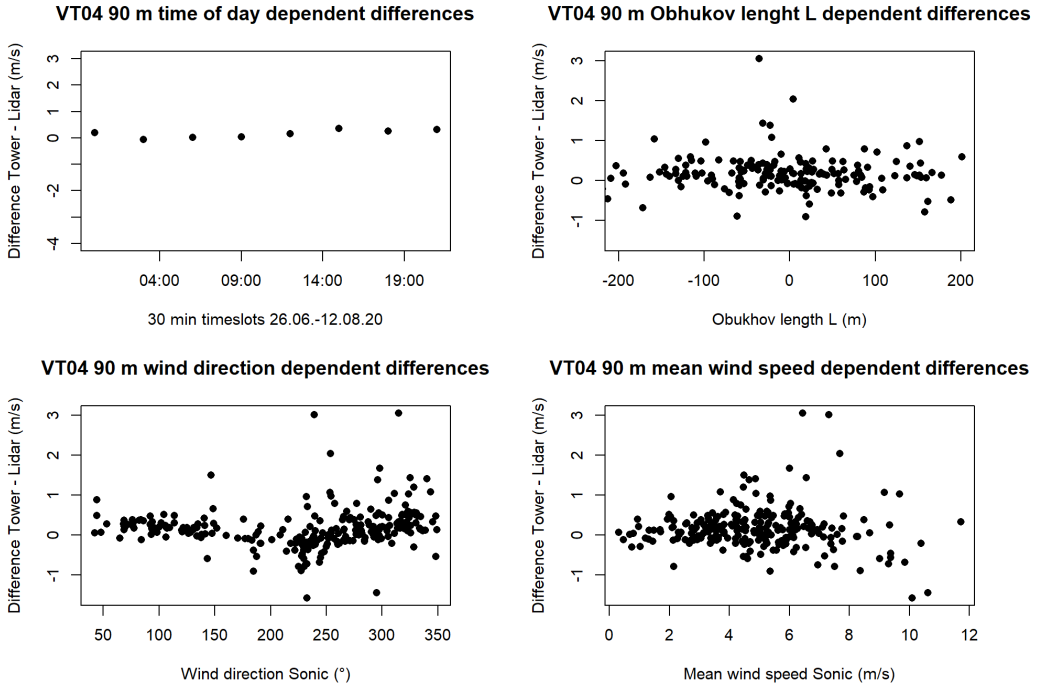




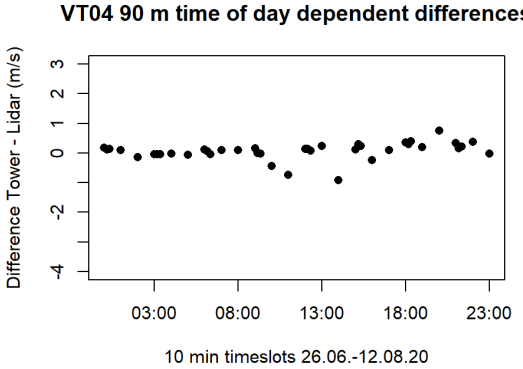
KIT 90 m Stare dependencies 30 min

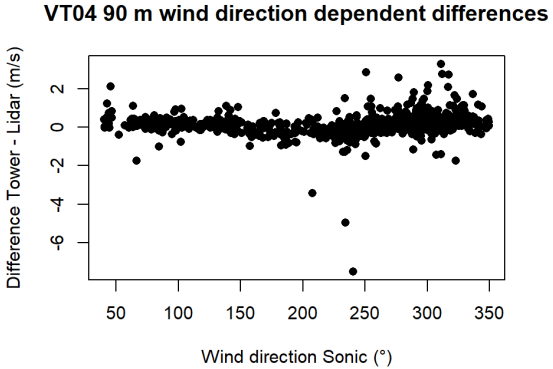


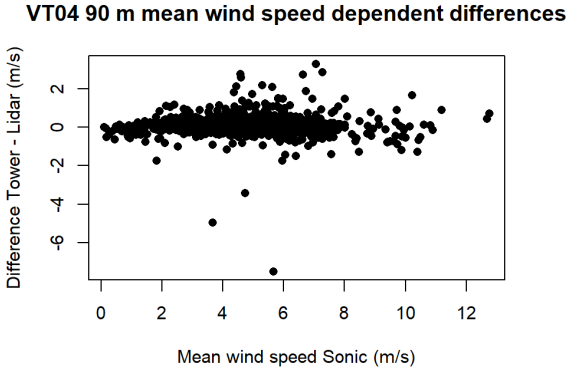
KIT Step/stare dependencies 30 min



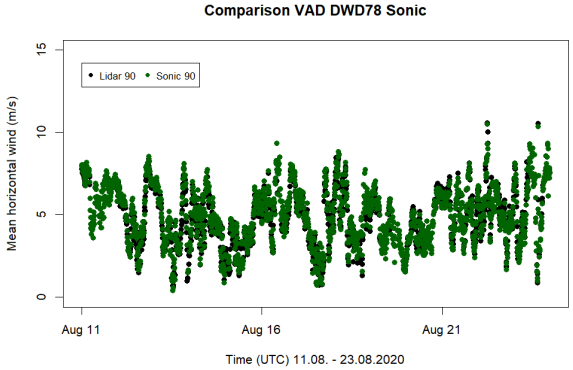
KIT Step/stare dependencies 10 min

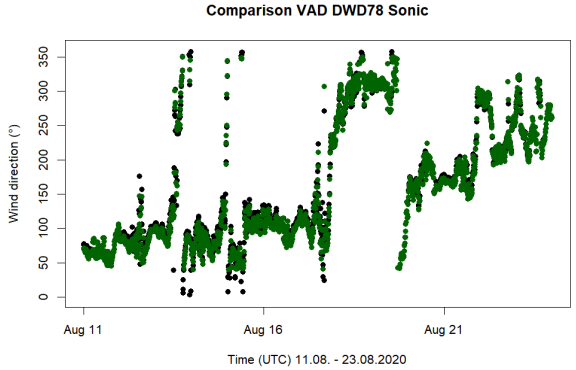


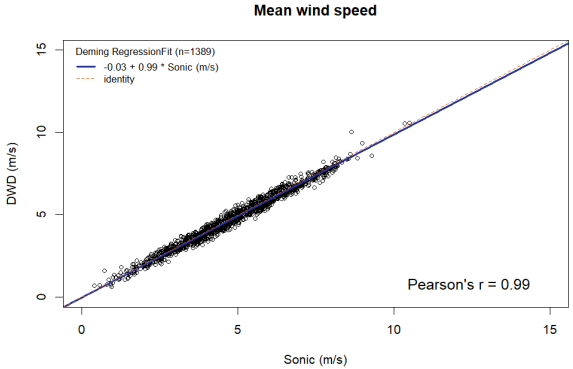


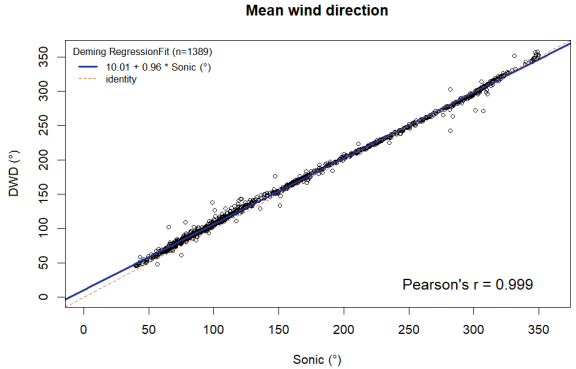


Comparison DWD Single Lidar VAD – Sonic Anemometer 10 min AVG









Comparison DWD Single Lidar VAD – Sonic Anemometer 30 min AVG

