

# ETHER EMBEDDED

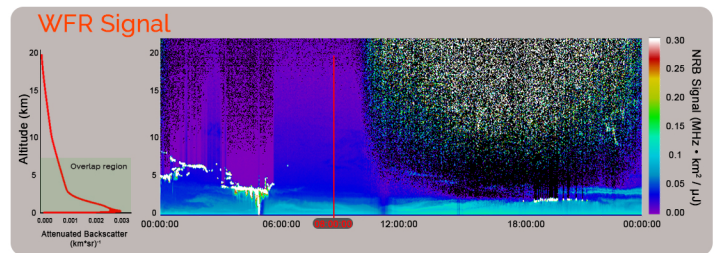
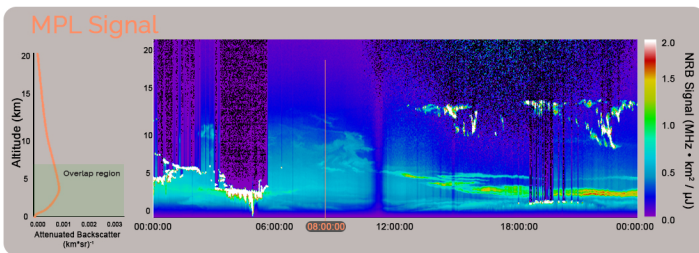
## WIDE-FIELD RECEIVER (WFR)

CONCEPT

The WFR offered by Aether Embedded provides a separate receiver system used for calibration and validation of the Model 4 Micro-Pulse Lidar (MPL). The compact design of the MPL also means that it needs an extra calibration to account for the geometric overlap - a condition inherent to all coaxial lidar wherein the first ~4-7km of the signal requires a correction factor. Traditionally, an MPL needs to be calibrated next to a reference MPL or by transmitting horizontally and assuming a homogenous and clear atmosphere. The WFR solves this by offering a solution for already fielded MPLs without either of those needs.

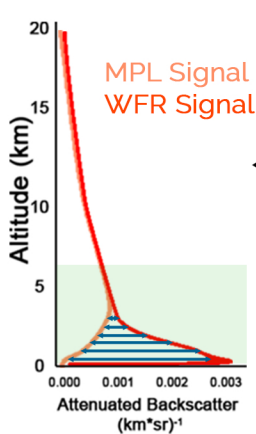


The fiber-coupled receiver mounts within the center shadow of the transmitted beam and collects a second data set coincident with the normal MPL data acquisition. This second channel has a larger field of view and is able to resolve backscattered light from much lower than the MPL's native channel. Since the two receivers are collecting the same laser pulse, deriving the overlap calibration becomes a simple matter of comparing the two signals to obtain a scaler factor.



In the example above, a two hour time average was taken centered about 08:00 UTC, shown by the orange and red lines for the MPL and WFR, respectively. Note the differences in signal within the first ~6-7 km, specifically how the MPL 'undersamples' the atmosphere and reports a lower signal near the surface.

This undersampling needs to be corrected using a scaler, derived simply by comparing the MPL and WFR signals. Despite the lower SNR, the WFR was able to resolve layering throughout the nighttime and even well into the daylight hours.



Develop  
↔  
Scaler

