

AQ500

A measurement system, for example a cup anemometer or a remote sensor, is affected by data loss. When an average is calculated from the available observations, it may be biased. If the data loss is not dependent on what is being measured, the error is small (for a very large number of observations it approaches zero). But if the data loss depends on what is observed, the average will be incorrect or biased.

Let us study wind speed. When iced, a cup anemometer shows the wrong wind speed. If these values can be identified, which is not easy because icing may give overspeeding as well as underspeeding, they can be removed from the data set. A certain data loss occurs. Suppose that icing is more common in weak winds than in strong. Removing iced measurements then means removing weak winds. When the average is calculated, it will be too high. In statistics, one says that the probability of a valid wind speed observation is conditioned on the wind speed.

In the same way, a remote sensor may be afflicted by such conditioning. Lidars for example can be blinded by fog or low clouds, which mainly occurs in situations with weak wind (not including the special case of orographic induced fog or low clouds). In that case, the mean wind measured by the lidar will be too strong. Sodars in general may be disturbed by storm noise. The average wind speed measured by such a sodar will therefore be too weak. The above are examples and not an exhaustive account of the problems that can occur. From a statistical point of view it is not necessary to investigate the details behind data losses. It is however necessary to investigate possible conditioning, to quantify it and, if necessary, correct it.

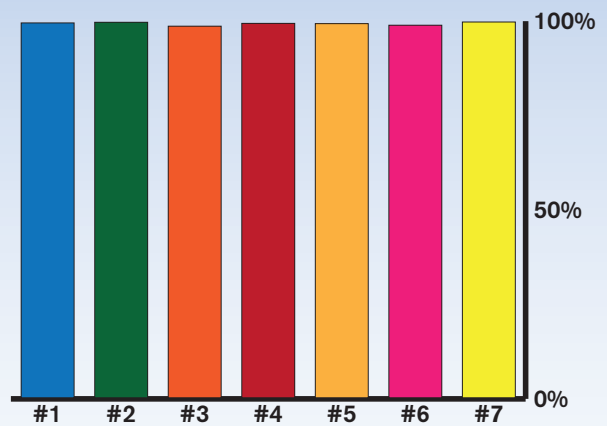
AQ500 is a remote sensing instrument based on the SODAR-technique. **AQ500** is based on more than 40 years of research experience and more than 300 instruments have been sold worldwide. The deployment is extremely easy and there is no need for building permits.

Sten-Ove Roden, Project Coordinator at AQSystem explains further:

“High data availability, which is essential for any wind measurement, has again been demonstrated by the AQ500 during the recent campaign in France. We have worked intensively to reach this level of field performance and are satisfied that our efforts are being paid off and to see the added value this brings to our customers.”

AQSystem performed a measurement campaign including seven **AQ500** in northern France with a local developer during three winter months 2011–2012. The average data availability, based on all seven systems, on the 100 meter level was over 97 percent! On the 150 meter level the average data availability was around 94 percent. This is enough high quality wind data to properly investigate the wind conditions in the project area with just a small probability of conditioning. Nevertheless, the data should always be thoroughly analyzed for possible conditioning.

A remote sensing instrument with data availability that makes a difference



Seven AQ500 in 3 month French measurement campaign with average data availability of over 97% at 100 meters.

Use AQ500 in your project to be sure of high data availability and avoid biased results!

 **AQSystem**
Remote sensing technique

www.aqsystem.se