

# **Quantifying the effects of airflow distortion on wind speed measurements from Voluntary Observing Ships**

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Wind speed measurements obtained from ship-mounted anemometers are biased by the presence of the ship which distorts the airflow to the anemometer. Until recently this bias had only been quantified for a few well-exposed anemometer sites on individual research ships, whereas the magnitude and even the sign of the bias was unknown for anemometers on Voluntary Observing Ships (VOS). Wind tunnel and numerical model studies have now been performed to quantify the pattern of airflow above the bridge of typical VOS. Typically the flow is accelerated by up to 15% or decelerated by 100% depending on position. Scaling laws have been derived to predict this bias given the anemometer position, the ship type and the ship length. These laws have been validated using measurements from a research ship. In practice, an anemometer should be mounted as high and as far forwards as possible on the wheelhouse top.