

**Comments on “Quality Assurance Guidance for the Collection of Meteorological Data Using Passive Radiometers,” Prepared by U.S. Environmental Protection Agency, Region 10 Office of Environmental Assessment, and U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards.
FINAL DRAFT 040711**

It is desirable to have onsite, continuous, accurate upper air data versus twice-a-day upper air balloon data that could be many miles away and unrepresentative of the site being evaluated due to terrain features. The key word here is accurate. Data and data collection procedures must adequately address concerns of accuracy and completeness.

Further concern is how the data can be used after it is collected. Models must be capable of using the data for the required analysis.

Guidance states:

Section 1. pg 2. It is up to the user to understand this limitation

Section 2, pg 7. “...it is critical that those tasked with interpreting comparison data must clearly understand both the instrumentation limitations of both the radiometer, and the radiosonde (or other comparison sensor), as well as the effect of the local meteorological conditions on the comparison.”

Section 3, pg 8. “Modeling requirements dictate the spatial and temporal resolution and will also affect the choice of measurement systems, as will the need in many cases to make comparable measurements with surface-based meteorological systems.”

My Questions or concerns: Sections 1, 2 and 3 all refer to the “user” or “those tasked” or “modeling requirements” to know, understand, or dictate the data obtained and how that data relates to the project. How are the “user” or “those tasked” or “modelers” selected and/or trained to meet the knowledge requirements of these statements? Is documentation of training or knowledge required? Should there be a reference to the QAPP process?

Guidance states:

Section 3, pg 8. “Ambient meteorological conditions and the potential of adverse weather to affect the instrument operation therefore affecting data quality and recoverability.”

My Questions or concerns: Is it known which meteorological conditions and how they impact to the data.

Guidance states:

Pg 9. Section 3. “More complex profiles, as measured by an in-situ measurement such as a high resolution radiosonde, with multiple significant inflection points that clearly identify changes in stability

in the atmosphere will inherently not be as accurately reproduced by the radiometer, and the criteria is recommended to be relaxed to $\pm 2.0^{\circ}\text{C}$ for the systematic difference and 3.0°C for the operational comparability.”

My Questions or concerns:” Ref 3 Crewell and Lohnert “...in situations with more than one inversion, only the lowest one can be resolved.” This will be an issue in many locations. How will this be resolved? Will radiosondes be available in situations where there is more than one inversion that could impact stability?

Guidance states:

Pg. 9. Section 3. . “To determine how well the radiometer detects significant thermodynamic changes in the atmosphere, the inflection points in the lapse rate that limit mixing can be compared to the independent sounding to determine if the radiometer detected inflections occur at the correct altitude. While this comparison is somewhat qualitative, the reported inflection point altitude can be compared against the actual inflection point altitude using a criterion based on the maximum altitude of interest from the radiometer measurements. As indicated in Section 2, a starting point for this criterion should be a value of $\pm 10\%$ of the maximum altitude of interest of the reporting system.”

My Questions or concerns: Will this drive the need to have an independent instrument co-located? If so, what would be the requirement to compare? On calibration dates? Once/month? Other?

Guidance states:

Section 2. pg 5 ... a maximum altitude of interest should be established, and the evaluation performed to determine if the radiometer performs acceptably to this defined altitude of interest. It should be noted that the defined altitude may be different from the radiometers maximum reported altitude. Thus, the evaluation will be performed on the altitude range of interest and not the full reporting altitude. Additionally, this altitude of interest may differ with season so the range specification may be different for different seasons. Once the maximum altitude of interest is established, then the ability of the radiometer to detect the significant inflections in the lapse rate can be evaluated using a quantitative evaluation criterion. This criterion is best defined by the specific application, but a starting point for the evaluation can be a value of $\pm 10\%$ of the maximum altitude of interest. Thus, if the defined maximum altitude of interest is 600 meters, then the evaluation criterion would be ± 60 meters for the detection of significant inflections, such as the inversion base or top.

My Questions or concerns: Whatever criterion is accepted n the evaluation needs to be meaningful to the modelers. Does the 10% correspond to model capability?

Guidance states:

Section 2. pg 6. To quantify the reasonableness of the data, one compares observations from the upper-air system being evaluated to data provided by another commonly accepted sensor that is known to be operating properly.

My Questions or concerns: Will this drive the need to have an independent instrument co-located?

Guidance states:

Section 4, pg 10. Siting and Exposure, Data collected at sites in regions with local geographic features such as canyons, deep valleys, etc., may be unrepresentative of the surrounding area and should be avoided, unless such data are needed to resolve the local meteorological conditions. Measurements made in complex terrain may be representative of a much smaller geographical area than those made in simple homogeneous terrain.

My Questions or concerns: Ref 3, Crewell and Lohnert conclude "A precondition is that the radiometer points over a homogeneous surface." How far away should the unit be from a hill or canyon to avoid impacts?

Guidance states:

Section 6.2.1, pg 17. "System audits should be conducted at the beginning of the monitoring program and annually thereafter."

My Questions or concerns: Should this be semi-annual? If only annually and used for PSD then checked at install and at end of year. Entire year of data could be lost.

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