ARM QCRad Goes Global

Contributors
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Research Highlight

The ARM Program developed the QCRad Value-Added Product (VAP) as a state-of-the-art algorithm for automated data quality assessment and testing of surface radiation measurements. The QCRad VAP output files are now the recommended source for all ARM surface radiation data at all sites.

The QCRad testing includes physically possible limits as determined by the World Meteorological Organization (WMO) baseline Surface Radiation Network (BSRN), as well as user configurable limits based on climatological analysis of data collected at the specific measurement site. The algorithm can be run in near-real time, or more typically on a daily basis as in ARM. Additionally, longer monthly or yearly runs can be used to assess more subtle tendencies and problems in the data through evaluation of daily summaries of quality flagging. Given the high costs of manual labor associated with traditional daily visual inspection of surface radiation data as a means of quality testing, this automated algorithm provides a considerable savings in measurement monitoring without sacrificing the quality of the assessment performed.

With the publication of this paper, the QCRad code is now available to all of the science community, a significant contribution from ARM science. It has been proposed that the BSRN might adopt the QCRad algorithm as their recommended surface radiation measurement testing methodology at the upcoming biennial BSRN Workshop to be held 7-11 July 2008 in De Bilt, Netherlands.

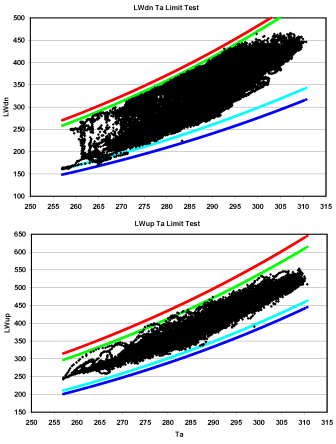

Figure: QCRad downwelling (top) and upwelling (bottom) longwave (LW) comparison testing using the well established correlation with ambient air temperature. Green and red represent the first and second level maximum limits, while light and dark blue represent the first and second level minimum limits.

Reference(s)

Long, CN, and Y Shi. 2008. "An automated quality assessment and control algorithm for surface radiation measurements." The Open Atmospheric Science Journal 2: 23-37, doi: 10.2174/1874282300802010023.

Working Group(s)

Radiative Processes