A Space and Time Surface Radiation Climatology of the ARM SGP Site

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Monthly Radiation Summaries

Time Series of Radiation Averages

Figure 1. Monthly plots of surface radiation variables taken from the SIRS instrument at Pawhuska (EF12). Albedo is calculated from $K_{up}/K_{dn}$. A summary table includes daily means and monthly sums.

Summary

We are in the process of developing the surface radiation budget for the SGP ACRF using Solar and Infrared Radiation Stations (SIRS) radiometers.

EF12 Pawhuska is used as a test-bed site because of its spatially homogeneous surface properties. Future work includes similar calculations at 6 EF sites.

Quality Checks (QC) are used to identify missing, questionable, and bad data. Practical application of these flags is limited.

Figure 2. Monthly averages of shortwave (K) and longwave (L) radiation plotted for 9 years of SIRS data at Pawhuska (EF12). Peaks of albedo indicate large snow events.

Figure 3 (above) Annual sums of $K_{dn}$ and $K_{up}$.

Figure 4 (above right) Annual sums of $K_{dn}$ with annual rainfall from Foraker Mesonet site. Their close relation is evident.

Figure 5 (right) Daily means and range of $K_{dn}$ and $K_{up}$ by month.

Figure 6. Annual albedo (very wet 2007) and mean monthly albedo and range for period 2002-2010.