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Evaluation of Three Downward Shortwave Radiative Flux Datasets for Near Real-time Land Surface Modeling

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In this study, radiative flux from three near real time numerical models– European Center for Medium-Range Weather Forecasts (ECMWF), Global Data Assimilation System (GDAS), AGRiculture METeorological (AGRMET) model estimate were compared with the SURFace RADiation Budget Network (SURFRAD) surface radiative flux measurements. It was found that the numerical model generally can accurately ($\pm$7 Wm-2) calculate the radiative flux in the clear sky conditions, but in the partial cloudy and cloudy sky conditions the numerical model with more sophisticated cloudy scheme give better radiative flux analysis the RMSE is about 30 Wm-2 smaller. This is mainly due to the model ECMWF and GDAS described the cloud characteristics with more realistic physics parametrization while the empirical method works less effective in the cloudy sky conditions. It was also found that the geographic boundary conditions also affects the flux analysis accuracy.