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Evaluate the accuracy of surface radiation budget of satellite products and GCM outputs in the Tibetan Plateau

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Current surface radiation budget products from satellite retrieval and model output have cover long-term periods and are globally available, and their validations are very important for applications to large-scale and long-term agricultural and hydrological studies. Although these products have been evaluated in many lowland regions, it is necessary to evaluate their accuracy in very high regions, because radiation intensity is sensitive to elevations. The Tibetan Plateau is a key region of GEWEX and a reference site of the CEOP project, where surface radiation data were collected through field experiments in recent several years. Based on the in situ data, this study evaluated the accuracy of current surface energy budget of 3-hourly ISCCP-FD and GEWEX/SRB satellite products, and five GCMs forecasting/reanalysis outputs specialized for CEOP project. The results show that the downward shortwave radiation over the highland region was obviously overestimated by the models, a little underestimated in the ISCCP-FD satellite-based products, and clearly underestimated in GEWEX/SRB satellite products.