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Characteristics of Long-term Surface Heat Source and Its Climate Influence Factors in Central Tibetan Plateau

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Based on multi-level AWS data during 2001 to 2015 and eddy covariance data during 2011 to 2014 at Nagqu Station of Plateau Climate and Environment, the turbulent fluxes were calculated by a surface energy balance combination (CM) and eddy covariance (EC) method. A long-term heat fluxes and surface heat source were obtained with comparison and correction of EC and CM fluxes. The surface energy closure ratio is close to 1 in spring, summer and autumn. But it reaches to 1.34 in winter due to low net radiation observation value on snow surface. The sensible heat flux shows a ascend trend while latent heat flux shows a descend trend during 2002 to 2015. The surface heat source shows a descend trend. The analysis of the surface heat source indicates that it has a significant relationship with net radiation flux, surface temperature, soil moisture and wind speed. Particularly, the surface heat source has a significant response to net radiation flux throughout the year. There are obvious influences of surface temperature and soil moisture on the surface heat source in spring, autumn and winter. And the influence of wind speeds on surface heat source is strong only in spring. The annual variation of sensible heat flux and latent heat flux are obvious. Sensible heat flux reaches the maximum value of the year in April and the minimum value in July. however, latent heat flux shows the maximum value in July and the minimum value in January.