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## Partitioning of evapotranspiration in four grassland ecosystems with a two source model

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**Introduction** The Shuttleworth-Wallace model (S-W model) (Shuttleworth and Wallace, 1985) is a two source model well known for its good performance on partitioning ecosystem evapotranspiration (ET) into soil evaporation ( $E$ ) and vegetation transpiration ( $T$ ). However, its applications on China's grasslands and for long periods are rarely documented. In this study, we use this model to estimate ET and the two components  $E$  and  $T$  over 2~3 continuous years on four grassland ecosystems in China.

**Results and discussion** Based on outputs of the model, the spatiotemporal dynamics of E/ET were described as well. Results indicated that modeled ET for the four ecosystems agreed well with the eddy covariance measurements at the half-hourly, daily and annual timescales, suggesting a good performance of the S-W model over a long-term period on China grasslands. Diurnally, E/ET was high in the morning and afternoon, and low in the late morning. Seasonally, E/ET decreased with the progress of growing season and declined after the active periods. Processes controlling the dynamics of E/ET at different timescales were different. Half-hourly, E/ET was mainly controlled by canopy conductance, and seasonally and interannually, the leaf area index (LAI) was the main controller. In general,  $E$  accounts for a great proportion of ET on typical grasslands in China. E/ET ranged from 0.1 to 0.57 during the peak growing seasons and totally 0.52~0.74 for the whole year.

### Reference

Shuttleworth WJ, Wallace JS. (1985). Evaporation from sparse crops-an energy combination theory. *Q. J. R. Meteorol. Soc.*, 111, 839-855.