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## Diurnal pattern of the drying front in desert and its application for determining the effective infiltration

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**Abstract.** Located in western Inner Mongolia, the Badain Jaran Desert is the second largest desert in China and consists of a regular series of stable megadunes, among which over 70 permanent lakes exist. The unexpected lakes in desert attracted research interests on exploring the hydrological process under this particular landscape; however, a very few literatures exist on the diurnal and spatial variation of the drying front in this area, which is the main issue in the desert hydrological process to characterize the movement of water in soil. In order to understand the drying front in the Badain Jaran Desert, a field campaign was conducted by the observations of soil physical parameters and micrometeorological parameters. With the field data, the performance of a vadose zone soil water balance model, the HYDRUS, was verified and calibrated. Then, the HYDRUS was used to produce the spatial and temporal information of coupled water, water vapour and heat transport in sand to characterize the variation pattern of the drying front before, during and after the rainfall. Finally, the deepest drying front was applied to determine the effective infiltration, which is defined as the amount of soil water captured by the sand beneath the deepest drying front by infiltrating water of an incident rainfall event.

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