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Simulation of the catchment evapotranspiration based on different soil-vegetation parameterization schemes

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Vegetation and soil are important carriers in water cycle, therefore, soil-vegetation parameterization is importation in catchment hydrological simulation. In this study, the soil-vegetation parameterization schemes in a distributed physically-based hydrological model (GBHM) and the water-energy balance model is discussed to predict actual evapotranspiration in the Luan River basin. Comparison between the physically-based hydrological model and the latter lumped conceptual model can help us understand the dominant control factors on catchment evapotranspiration at different time scales. From the analysis through comparison, it is shown that both simulations of these two models give very close values of annual evapotranspiration and the same complementary relationship between actual and potential evapotranspiration can be found at the annual time scale. The catchment annual evapotranspiration is controlled mainly by the annual precipitation and potential evaporation. While the impact of variability of soil water and vegetation become more important at a smaller time scale. It is also known that the relationship between potential and actual evapotranspiration shows a highly nonlinear relationship at the annual and catchment scale, but can be simplified to a linear relationship at hourly temporal and hillslope scales.