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Water/nitrate fluxes and transport in deep vadose zone of typical irrigated cropland in North China Plain

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North China Plain is one of the agricultural regions in the world with severe water shortage. Flood irrigation is still the most popular irrigation method in NCP, and has caused very low water use efficiency. Groundwater depletion becomes the most concerned issue for sustainable development. To determine the water & nitrate fluxes is important for better water resources management. We built up a 48-m in depth of cation and a 36 lysimeter group for this purpose to study the water budget and water/nitrate movement in the deep vadose zone. In this study, we will present the observation facts using these two facilities to reveal the differences between water transport velocity and celerity in the deep vadose zone of nearly 50 meters. This is the first time to observe the variations or responses of soil potential, moisture, temperature, and electricity conductivity to water inputs from land surface, such as extreme rainfall, directly in the deep vadose zone of 48 meters. We will also present the fresh observation results from the 36 lysimeters about ET and drainage fluxes of different cropping patterns, with different watering and fertilizing treatments. The latter experiment could provide useful information for improving the water/nutrients management for different cropping systems in NCP, and will be beneficial to sustainable groundwater management at the aspects of quantity and quality. The results of the observations using these new facilities is presented at international conference at the first time. We hope it could be interesting to the colleagues worldwide.