

***Interactive comment on “Groundwater response to leakage of surface water through a thick vadose zone in the middle reaches area of Heihe River Basin, in China” by X.-S. Wang et al.***

**Anonymous Referee #2**

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The surface water-groundwater interaction in arid regions is a hot topic and has received many attentions in recent years. The case in the middle reaches of the Heihe River Basin is analyzed by authors, and the influences of thick vadose zones are especially discussed. The research is of much significance and the paper is well written. In my view, the paper can be published under minor revision. My comments are the following: (1) In the part “2.3 Leakage of Heihe River”, the introduced method may be based on a suppose, which is that the model period is divided into many small periods by using one dimensional model, and in each small period, the flow in the open channel is under steady state. The authors should clarify it. (2) In the part “3.1 Equations

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of flow in the vadose zone”, the source and sink should be added in the mathematical equation. (3) In the part “4.1 Description of the triple-reservoir model”, the ms established a triple-reservoir model. For a reservoir model, the regulation for water use is an important section in the conjunctive use of surface water and groundwater. The authors should discuss it. (4) In the part “4.2 Estimation of the parameters”, I cannot find the change of the river stage. Are there some observations of river stage for the Heihe River? The values are critical for the model results.

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