**Review and Comments on Paper "Groundwater response to leakage of surface water through a thick vadose zone in the middle reaches area of Heihe River Basin, in China"**

Heihe River basin is the second largest inland river basin in China. During the past years, water resources issue in the basin has been paid much attention by government and public in China. Authors in this paper made great efforts to investigate the groundwater response to the leakage of surface water through a thick vadose zone in the middle reaches of the Heihe River basin. Some results are interesting and helpful for local water resources planning and management. The paper may be considered for possible publication on the journal of Hydrology and Earth System Sciences after revision. Major revisions include:

1.  P.7615: Authors mentioned that "As shown in Fig. 2, flow rate of Heihe River at Yingluo 25 Gorge is 10–220m$^3$/s monthly and 11–23×108 m$^3$/a annually during 1989–2005". Related concepts are not professional. You can say "monthly streamflow", "annual streamflow" or "monthly runoff", "annual runoff", "streamflow" and "runoff" are different concepts.

2.  Where the illustrations are located in the context? Suitable locations should be given by authors.

3.  P.7617: $K_L$ is not found in equation (1).

4.  P.7618: How to consider evaporation? If the simulation period is long, this amount should be great.

5.  P.7619: What does the "flow introduced …"? Is it "return flow"?

6.  P.7619: Authors mentioned that "Evaporation over water table in the river is ignored because the total evaporation loss between site-1 and site-3 is less than 0.4% of stream flow at Yingluo Gorge". Where this conclusion comes from? According to the fact given in p.7616, the annual evaporation is greater than 2000 mm! It can never been neglected!

7.  P.7620: What does $F_0$ mean?

8.  P.7621: Authors mentioned that "θs=0.25, θr=0.05, $\alpha$=1.2m$^{-1}$ and n=1.5 are applied in this study", and "Ks=10 m/d". Where these values come from? How to estimate these parameters? Reasons should be given in the context.

9.  P.7622: Where Figures 5 and 6 are located? They are not mentioned in the manuscript.

10. P.7630: In the verification of the model, some evaluation indexes on the results should be given. For example, Nash-Sutcliffe coefficient of efficiency, correlation coefficient, and relative error should be good choices.

11. English improvement is still needed.