

## ***Interactive comment on* “Direct or indirect recharge on groundwater in the middle-latitude desert of Otindag, China?” by Bing-Qi Zhu et al.**

**Anonymous Referee #2**

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The work consists in a hydrogeochemical and isotopical study to determine the origin of the groundwater in a sandy desert region of China, bordered by a flat steppe terrain and mountainous regions. The authors propose an accurate analysis of the isotopes and ion chemistries of different water samples including natural samples collected from precipitation, depression spring, shallow and deep aquifers, perpetual lakes and outflowing rivers. They conclude that the groundwater in this desert is possible to originate from remote mountain areas and that the linkage between the desert area and the mountain region is crucial. They use multiple environmental tracers, taking into account the topography, the geomorphology, the climate, the vegetation and the soil, the geology and the hydrology of the Otindag Desert and its surrounding areas. However, in my opinion, the methodology they use for the hydrogeochemical investiga-

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tion/interpretation, the key of the study, is not innovative or firstly applied in this kind of problem. Moreover, the outcomes derived (basically) merely by isotopical investigation are not supported by any hydrogeological model. A proper model could take into account and quantify in an integrated scenario the complexity of interacting physical phenomena such as the flow and transport processes, the spreading the mixing and the diffusion of the investigated tracers and the variable (in time and space) recharge in such heterogenous domain. Therefore, I do not think this work is now prompt for publication in HESS.

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