Hydrol. Earth Syst. Sci. Discuss.,
doi:10.5194/hess-2015-385-AC1, 2016

Hydrology and Earth System Sciences
Discussions
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EGU

Interactive comment on "Geochemical inverse modeling of chemical and isotopic data from groundwaters in Sahara (Ouargla basin, Algeria)" *by* R. Slimani et al.

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Received and published: 28 April 2016

The authors are very thankful and grateful to the two referees who accepted to evaluate the work presented in the submitted manuscript and for their valuable remarks.

1- Values displayed in table 6 are dated back to November 1992 so they are old values. This is the main reason why they are considered high comparatively to what is expected to be found nowadays. In fact, at present times, tritium figures have fallen lower than 5 TU in precipitation measured in the northern part of the country.

2- Where and when the rain sample was collected:

The value of 16 TU in precipitation was collected from Ouargla itself (from the National

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Agency for Water Resources (ANRH) station).

3- The value of 16 TU seems to be high but we can note the following remarks:

We are in an arid area (desert) where precipitation is very scarce and irregular. Precipitation takes place in the form of sudden thunderstorms in and unsaturated atmosphere and a great part of this precipitation evaporates back into the moisture unsaturated atmosphere sometimes during many cycles. Consequently, an enrichment in tritium happens because when water evaporates back, the lightest fractions (isotopes) are the ones that evaporate first causing an enrichment in Tritium in the remaining fraction. The 16 TU value would thus correspond then to a rainy event that had happened during the same sampling period (Nov. 1992). It's the only available value and it's is not a weighted mean for a long period of time. It's the most representative value for that region and for that time. Unfortunately, all the other stations (Algiers, Ankara, and Tenerife) are subject to a completely different climatic regime and beside the fact that they have more recent values, can absolutely not be used for our case. Therefore all the assumptions based on recent tritium rain values do not apply to this study.

Unfortunately due to a technical problem at that time, no deuterium values were made available for those samples

Depleted contents in O-18 and low tritium concentrations for phreatic waters fit well the mixing scheme and confirm the contribution from the older and deeper CI/CT groundwaters. The affected areas were clearly identified in the field and correspond to locations that are subject to a recycling and a return of irrigation waters whose origin are CI/CT boreholes. Moreover, the mixing that is clearly brought to light by the Cl vs. O-18 diagrams (Fig. 15 & 16) could partly derive from an ascending drainage from the deep and confined CI aquifer (exhibiting depleted homogenous O-18 contents & very low tritium), a vertical leakage that is favoured by the Amguid El-biod highly faulted area (geological argument).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2015-385, 2016.