Dear editor,

The authors are very thankful and grateful to Associate Editor for their valuable remarks.

The following modifications have been made:

1- The title has been modified

- Line 1 : Geochemical inverse modeling of chemical and isotopic data from groundwaters in Sahara (Ouargla basin, Algeria).
- Identification of dominant hydrogeochemical processes for groundwaters in Algerian Sahara supported by inverse modeling of chemical and isotopic data.

2- The whole paragraph has been modified

- Lines 40 to 55 : The present study…
- The present study aims at applying for the first time ever in Algeria, inverse modeling to an extreme environment, characterized by a lack of data on a scarce natural resource (groundwater). In the present study, new data were collected in order to characterize the hydrochemical and the isotopic composition of the major aquifers in Ouargla's region and identify the origin of the mineralization and water-rock interactions that occur along the flow. New possibilities offered by progress in geochemical simulations were used. More specifically, evaporite dissolution, ion exchange, calcite dissolution / precipitation and CO_2 escape or dissolution and mixing can be quantitatively assessed by inverse modeling (Dai and al., 2006) with Phreeqc 3.0 to explain the modifications of the chemical composition of the three main Saharan aquifers. This results in constraints on mass balances as well as on the exchange of matter between aquifers.

3- It has been rephrased.

- Line 83 : The exploitation of
- The exploitation of Senonian aquifer dates back to 1953 at a depth between 140 to 200 m,

4- It has been deleted.

- Line 92 : A total of (n = 107) samples…
- A total of 107 samples were collected during a field campaign in 2013,

5- It has been replaced.

- Line 177 : This is illustrated…
- This is illustrated by a decrease of the $[HCO_3^-]/([Cl^-] + 2[SO_4^{2-}])$ ratio (Fig. 8) from 0.2 to 0 and of the $[SO_4^{2-}]/[Cl^-]$ ratio from 0.8 to values smaller than 0.3 (Fig. 9) while salinity increases.

6- It has been replaced.

- Line 185 : $[Na^+]/[Cl^-]$ ratio is from…
- $[Na^+]/[Cl^-]$ ratio ranges from 0.85 to 1.26 for CI aquifer, between 0.40 and 1.02 for the CT aquifer, between 0.13 and 2.15 for the Phr aquifer. The measured points from the three

considered aquifers are linearly scattered with good approximation around the unity slope straight line that stands for halite dissolution (Fig. 10).

7- It has been replaced.

- Line 203 : However, nine samples from phreatic aquifer
– However, nine samples from Phr aquifer

8- It has been corrected

- Line 243 : factor and K is a constant
– factor and *k* is a constant

9- It has been replaced.

- Line 268 : …(cf. infra. 3.6.).
– …(see section 3.6)

10- It has been corrected

- Line 285 : …this raifall…
– A major part of this rainfall

11- It has been replaced.

- Equations 6, 10 and 11: …+ cte
– …+ *constant*

12- It has been corrected.

- Line 430 : …$\varepsilon = 100(\alpha - 1)$
– …$\varepsilon = 1000(\alpha - 1)$

13- The decimals have been erased from latitude and longitude values.

14- We kept one significant digit more than in table 7 to avoid rounding errors if anyone wants to reuse our data.

15- The figures 8 and 9 have been improved by using log-log axes.

16- In figures 11 and 12, the square at the origin of the axes is not corresponding to a sample belonging to CI.

17- The point of Seawater has been added in figures 11 and 12

Best regards

SLIMANI Rabia