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CORRECTION **Open Access**

Correction to: How do the geological and geophysical signatures of permeable fractures in granitic basement evolve after long periods of natural circulation? Insights from the Rittershoffen geothermal wells (France)

C. Glaas[1,2*], A. Genter[1], J. F. Girard[2], P. Patrier[3] and J. Vidal[1]

*Correspondence:
carole.glaas@es.fr
[2] CNRS, UMR 7516 IPGS,
University of Strasbourg,
5 Rue René Descartes,
67084 Strasbourg Cedex,
France
Full list of author information is available at the end of the article

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After publication of the article (Glaas et al. 2018), it has been brought to our attention that there are some errors. The authors have listed them below.

In the "Borehole data and methods" section, the vertical resolution and horizontal resolution in the header of the Table 1 are not information about the data resolutions. Instead, "Vertical resolution and Horizontal resolution" should be replaced by "Vertical sampling and Horizontal sampling".

In the "Electrical logs; Petrophysical observations" section, the issues of the following sentences are incorrect: "Although RLA1–4 represent the resistivity closer to the borehole, they have a better vertical resolution than RLA5; thus, we show them in the figure for reference". The article should instead state: "Although RLA1–4 represent the resistivity closer to the borehole, we show them in the figure for reference, but the work in this article focuses on the RLA5 curve only."

In the "Electrical logs; Synthetic resistivity" section, the value of the counterions mobility (noted B) used in Eq. 5 is false.

We used $B(25\ ^{\circ}\mathrm{C}) = 5.19 * 10^{-8}\ \mathrm{m^2 s^{-1} V^{-1}}$ which corresponds to the $\mathrm{Na^+}$ ions mobility in bulk water. Instead, as it has been recently published, we should have used a mobility value accounting for the mobility of the counterions in the Stern layer and in the diffuse layer. Following Eq. 2 in Ghorbani et al. (2018), the mobility can be expressed as $B = \beta_{(+)}\left(1 - f\right) + f * \beta^{s}_{(+)}$. The value of the mobility of the counterions in the diffuse layer $\beta_{(+)}$ is the same as in the bulk pore water. The mobility of the counterions in the Stern layer is smaller $(\beta^{s}_{(+)}\left(\mathrm{Na^+},\ 25\ ^{\circ}\mathrm{C}\right) = 1.6 * 10^{-9}\ \mathrm{m^2 s^{-1} V^{-1}})$ and a typical value is $f = 0.95$ (Revil et al. 2017a, b). The correct value is then $B(25\ ^{\circ}\mathrm{C}) = 4.2 * 10^{-9}\ \mathrm{m^2 s^{-1} V^{-1}}$.

This value is 10 times smaller than the value used in the calculation of the surface conductivity in the article, hence the clay contribution to the resistivity is ten times overestimated in the article. It has several consequences discussed hereafter.

Using the wrong value of B, we evaluated the contribution of the surface conductivity to be of the same order than the volume conductivity (see Fig. 7a). Then we used Eq. 6 to optimize the weighting of each term through two coefficients (see Fig. 7b). The optimization of a synthetic log considering only the Archie's term ($\text{coef2} = 0$) yields a coefficient acting as a geometrical factor, i.e. a rough approach to convert the formation resistivity to the measured (apparent) resistivity RLA5.

When we observed which could be the best weighting coefficients (Fig. 7b), the minimum RMS is obtained when the clay term is emphasized 10 times ($\text{coef1} = \text{coef2}$ with wrong B value) or 33 times ($\text{coef1} = 0.15$ and $\text{coef2} = 0.56$), which is far away from an acceptable range from the nowadays well established model (Eq. 1).

The reader should consider the following changes.

- In Eq. 5, the right value of $B(25\ ^\circ\text{C})$ is $4.2 * 10^{-9}\ \text{m}^2\text{s}^{-1}\text{V}^{-1}$.
- In Fig. 7a, the "clay term" resistivity log is in fact 10 times higher (and the contribution to the conductivity is 10 times lower).
- In the paragraph after Eq. 7, "Optimization is illustrated in the cross-plot ..." until "... good fit results are also obtained.", considering the factor 10 for B, the conclusion is that the clay term should be inappropriately emphasized to have an effective contribution. Then, the surface conductivity plays a negligible role here.

In the "Discussion; Resistivity signature of permeable fracture zones" section, we wrote "it was also shown that both porosity and clay content/type control the resistivity value" which is true, but the sentence "with the clay term dominating (Fig. 7)" is wrong.

Based on our available logging data and synthetic models, the influence of clay through the surface conductivity on the resistivity of the studied granites is negligible. Some petrophysical work on samples could help to go further on this question.

Note that we found no consequences in the introduction and conclusion paragraphs.

Author details
[1] ES Géothermie, 5 RUE de Lisbonne, 67300 Schiltigheim, France. [2] CNRS, UMR 7516 IPGS, University of Strasbourg, 5 Rue René Descartes, 67084 Strasbourg Cedex, France. [3] CNRS UMR 7285 IC2MP, HydrASA, University of Poitiers, Bat B8, Rue Albert Turpain, TSA51106, 86073 Poitiers Cedex 9, France.

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