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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Hydrochemical characteristics of the hot spring waters in the Kangding district related to the Lushan M_S 7.0 earthquake in Sichuan, China" *by* Z. Chen et al.

Anonymous Referee #2

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GENERAL COMMENTS

The manuscript objective is the investigation of the hydrochemical variations of spring waters in the Kangding district before and after the Lushan MS 7.0 earthquake in Sichuan Province, southwestern China. The observed changes in groundwater composition are clearly related to the seismic event, however the identified anomalies appear to be a consequence of the seismic event and not a precursors of it. The manuscript report an interesting data set and deserve to be published in NHESS but need some changes to be accepted for publication. In particolar the geochemical processes producing (i) the original groundwater composition (ii) the earthquake related changes,

should be investigated/explained better.

SPECIFIC COMMENTS

- lines 87-91. Chemical types of spring waters The authors classificate the sampled waters in 7 groups using the Shoka Levs classification method, but they dont explain what are the principal water rock interaction processes generating these types of water. Looking at the data it seems that there are 3-4 main types of water while the other types are probably the result of mixing processes between the main types. A Piper or Langelier Ludwig diagram could show better the possible mixing processes. Furthermore a study of speciation-saturation indexes is needed.

- lines 93-94 – "The hydrochemical parameters of the spring waters before and after the Lushan MS 7.093 earthquake evidently varied with the amplitudes ranging from -73.3 to 231.9 mg/L". This sentence is not clear, how can a concentration have a negative value (-73.3 mg/L)

- line 98 and Fig.3 – not clear why the Guanding waters show a decrease in Na and TDS but an increase in Ca and HCO3, dilution and simultaneous dissolution of calcite? Please explain better.

- Fig 3 – Why the four diagrams of Fig.3 dont show the full data set?. In the Ca diagram are shown the data of 7 springs (but only 3 for SO4), in the HCO3 and TDS diagrams are shown the data of 6 springs and in the Cl and Na diagram only four springs are shown.

- Conclusions. The observed changes in groundwater composition are clearly related to the seismic event, but are a consequence of the seismic event rather than a precursors of it. The authors talk invoke in general terms the water rock interaction processes in order to explain some chemical changes, but show only the overall reaction of CaCO3 dissolution. They should do some aqueous speciation calculation to assess what minerals react with groundwater and their saturation state.

TECHNICAL CORRECTIONS Fig.3 – The figure show four diagrams. Please add a, b, c, d, to the diagrams.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 7293, 2014.