

Interactive comment on “Poroelastic responses of confined aquifers to subsurface strain changes and their use for volcano monitoring” by K. Strehlow et al.

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Dear Authors

In my opinion the scientific and presentation quality of this manuscript is good - at the same time, I think that the manuscript requires moderate revisions to improve its scientific contribution.

This paper is technically correct but I have major doubts about the practical application of the approach proposed to volcano monitoring.

The uncertainties about the elastic properties of the crust, physical parameters of a

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magma chamber and hydraulic parameters of the aquifers would make practically very difficult the development of a "realistic" numerical model that could be employed to monitor a volcano.

In my opinion, this work should not be proposed as a study on a new volcano monitoring technique but as an investigation on the unrest at volcanoes where major changes in the water level were measured before an eruption. The research question the manuscript could answer is "what can we learn about the physical processing preceding the eruption at Usu volcano (or other volcanoes) if we study the changes in the water level".

Similar studies have been proposed in the past to investigate water level changes triggered by earthquakes [e.g., Brodsky, E. E., Roeloffs, E., Woodcock, D., Gall, I., & Manga, M. (2003). A mechanism for sustained groundwater pressure changes induced by distant earthquakes. *Journal of Geophysical Research: Solid Earth* (1978–2012), 108(B8).] or the physics of calderas [Hutnak, M., Hurwitz, S., Ingebritsen, S. E., & Hsieh, P. A. (2009). Numerical models of caldera deformation: Effects of multiphase and multicomponent hydrothermal fluid flow. *Journal of Geophysical Research: Solid Earth* (1978–2012), 114(B4).]

So, my suggestion would be to give less prominence to the parametric study of the numerical model and much more space to the application of the model to a case study (e.g., the water level changes measured at Usu volcano before the 2000 eruption)

Given that the paper is technically sound and well written, I think that the manuscript could be accepted subject to moderate revision - unfortunately this option is not present in the recommendation to the Editor, so I had to go for major revisions

Best regards, Maurizio Battaglia

Specific comments to the text are available in the attached PDF file

Please also note the supplement to this comment:

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<http://www.solid-earth-discuss.net/7/C871/2015/sed-7-C871-2015-supplement.pdf>

Interactive comment on Solid Earth Discuss., 7, 1673, 2015.

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