

Interactive comment on “New zircon data supporting models of short-lived igneous activity at 1.89 Ga in the western Skellefte District, central Fennoscandian Shield” by P. Skyttä et al.

Anonymous Referee #2

Received and published: 8 May 2011

This paper presents SIMS ages on zircons from one felsic volcanic rock and three intrusive granitic rocks located in the Skellefte District (Fennoscandian Shield, Sweden). The results have important implications for both the age of VMS deposits and the timing of magmatic activity in the Kristineberg mine area. The paper is well written and documented, and the overall quality is good. The manuscript is thus potentially worthy of publication in Solid Earth. However I have some concerns I would like to see addressed before the publication of the manuscript:

- Section 2 ("Geological overview") is too long and may be difficult to read for the non-specialists. This section represents about 1/3 of the manuscript (excluding references

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and figures caption), and I would recommend reducing its size to less than 800 words. Only information relevant for the discussion should be conserved here, and more information could be added in Fig. 1 & 2 caption.

- Section 3 ("Geochronology") shows an important number of discordant analyses (>50% of the data), which are mostly related to the presence of cracks and/or inclusions in the analysed areas. The authors mention that SEM imaging was performed prior to SIMS analyses, in order to select analysed areas. This is a widely used procedure for in situ dating of accessory minerals, which contributes to improve the quality of U-Th-Pb data. So why did the authors analyse a large number of areas with cracks, inclusions, etc, which should have been (normally) avoided? I am afraid that the analytical strategy seems a bit unclear to me. Also sample IV shows an important number of both discordant and reversely discordant analyses. For this sample, the authors claim that "there is no obvious correlation between discordance and location of analytical spots at inclusions, cracks or at across the crystal-epoxy interface"; and they suggest that the "analytical problems" observed in the data might be related to the location of the sample in the sample holder. Why would discordant ages not be caused by primary/secondary geological processes? This point should be developed and references dealing about analytical artefacts during SIMS analyses are also needed.

- Finally some other points the authors may wish to consider: Fig. 1: the key is difficult to read, please increase its size by at least 50%. Fig. 6: please mention that this is a Tera-Wasserburg type concordia. Table 1: the discussion over missing data point n3448-10a is not relevant.

Interactive comment on Solid Earth Discuss., 3, 355, 2011.

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