Geosci. Instrum. Method. Data Syst. Discuss., 3, C112–C113, 2013
www.geosci-instrum-method-data-syst-discuss.net/3/C112/2013/

Geoscientific Instrumentation Methods and Data Systems
Discussions

Interactive comment on "Automated field detection of rock fracturing, microclimate, and diurnal rock temperature and strain fields" *by* K. Warren et al.

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Received and published: 18 July 2013

It is interesting that cracks always form in the afternoon. The distribution is very clear, and very dramatic. Afternoon (and summertime) clustering points to a positive correlation between overall rock temperature and AE events. It will be interesting to see the relationship between the external weather and event density on different days. As stated by the authors, the data in Fig. 5c shows a drop in wind speed that may have played a role in producing events on that day, but other event clusters may have a different primary source. Have possible sources been identified yet?

The location data is much less clear, though that is to be expected using AE methods with real rock, rather than a homogeneous cube. It is not surprising that the events occur mostly in the northern hemisphere. The lack of E-W bias seems likely to be at least partly a function of the boulder size. Perhaps the cited modeling by collaborators can help to explain this. There does appear to be a slight bias towards the western hemisphere, but was not mentioned by the authors. Perhaps it is not statistically significant.

It is also interesting that the authors have identified tensile strains parallel to the surface. This would not be expected from modeling, and has important implications on the limitations of models, and how they may be improved. In general, the strain seems to track with the rock surface temperature, as expected. It would be interesting to know if the measurements show signs of permanent deformation during insolation cycles.

The dataset seems very robust! Matching event clusters to possible causes to spatio-temporal locations should provide much-needed insight into how this process operates.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 3, 371, 2013.