

Interactive comment on “Post-glacial reactivation of the Bollnäs fault, central Sweden” by A. Malehmir et al.

Anonymous Referee #2

Received and published: 18 November 2015

Review of “Post-glacial reactivation of the Bollnäs fault, central Sweden” by Malehmir et al.

The authors present a new, highly interdisciplinary geophysical data set collected across the Bollnäs Fault. Thus, the study is highly multidisciplinary. This is an important strength of the acquired data set and the study. The study does present new, important geophysical models important for our understanding of the fault's geometry and evolution. However, the excellent data set has not been used to its full potential. I therefore recommend moderate to major revision of the paper.

Main comment:

The different methods and their resolution should be discussed and compared more

C1366

thoroughly. For example, the bulk part of the seismic rays used in the tomography probably travel more or less horizontally through the fault area providing good vertical resolution but only little lateral resolution. Contrary to this, the potential field data may be more sensitive to lateral variation. Depending on the electrode configuration, the geoelectrical measurements may have different sensitivity with respect to vertical and lateral resistivity changes. For the used geoelectrical gradient-array, how is the balance between lateral and vertical resolution? Thus, the resolution and strength and weaknesses of the different methods should be compared and discussed more thoroughly, and the interpretations of fault geometry and evolution should be discussed in the light of this. Such improved and critical model evaluation and discussions would constitute an important improvement of the paper.

Other comments:

The authors should be more precise with regard to description of the influence of the inclination on the magnetic anomaly. Exactly how is the magnetic field oriented in the area, and what are the effects of this orientation?

Implications with relation to natural hazards are mentioned already in the introduction of the paper. They should be elaborated on and detailed in the discussion part of the paper.

Figure 6: The offset scale should be linear. In the present format it is difficult to assess and compare apparent velocities.

What are the main simplifications if the underlying model used to estimate earthquake strength?

The “Future Studies” section is too extensive. Note only briefly one or two experiments that you could conduct to test the hypothesis/interpretation presented here.

Interactive comment on Solid Earth Discuss., 7, 2833, 2015.

C1367