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Interactive comment on “GB-InSAR monitoring and observational method for landslide emergency management: the Montaguto earthflow (AV, Italy)” by F. Ferrigno et al.

Anonymous Referee #1

Received and published: 18 January 2016

General comments The paper describes a continuous GB-InSAR monitoring of a landslide, focusing on the use of this tool for understanding the cinematic of the phenomenon, and on these bases design and build safety measures for risk mitigation and long term stabilization work. The GB SAR data processing and analysis described is plan, and it does not contain outstanding innovative or original aspects with respect to the state of the art of this topic. Although the direct link between GBSAR monitoring and Observational Method has not previously discussed, the content of the paper from this point of view is poor; in addition the operational aspects are not deeply discussed, missing a real comparison of the proposed approach with respect to the conventional monitoring. For example, the advantages of using the GBSAR monitoring, which al-

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lows obtaining undoubted spatial and temporal performances and fully remote observations, should be compared to the performances of optical sensors. As an example the authors claim that the proposed technique can produce savings in cost and time on engineering projects, but it must also consider that the cost of a GBSAR system dedicated to a single monitoring site for three years can be high. As far as the reading of the manuscript is concerned, it is difficult and several sentences are confused and unclear: an accurate rewriting is demanded. Some specific items are here below indicated. I suggest to improve the, poor, reference section, especially with papers focused on the same landslide monitoring if available.

Details Page 7248 Line 16: cancel out “ ;” Line 21 : the sentence is not clear.

Page 7249 Line 15: what is the resolution power of the GB-InSAR systems??I did never found this word.

Page 7251 Line 6: I think that only a few of readers can know who “Borboni” are; if the authors like to put this historical note, please add a reference.

Page 7252 Line: 2: I disagree with the use of the word “deformation field”. The technique is able to provide one component of the displacement. The selection of an opportune observational geometry only allows to optimize the estimate of the displacement when it maintains along a specific direction coincident to the line of sight. For example I guess that due to the complexity of the landslide, modelling it is not possible using only the GBSAR data. Were there installed other sensors capable of measuring the vectorial displacements? Is the GBSAR monitoring assisted by modelling or not?

Line 11: the equation, not numbered, is useless in the reading of the paper: I suggest deleting it.

Line 13-15: what do you mean with “installation method?” please clarify it; the remaining part of the sentence is totally undecipherable.

Line: 24: As previously commented, this item should be better discussed.

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Page 7253 Line 7: The sentence is not clear: what do you mean?

Line 18: What is a “visual calibration”???

Line 24: Considering the topic of the paper, this theme demands some details to evaluate the advantages of the prosed technique with respect to conventional approaches. A brief description and a reference, if available, about the other monitoring tools is important.

Page 7254 Line 9: not clear. It is important to explain how the methodology has been adapted with the changing conditions of the landslide.

Page 7255 Line 27 typo: slide change to sliding

Page 7258 Line 27 typo: compared change to compare

Page 7259 Line 14 : sentence not clear

Figure 10: The figure plots, in linear scale, the accumulated displacement while the legend probably refers to the instantaneous displacement. On these bases I disagree with the term used and the graphic representation. Considering the curve and the linear scale of the axes, the use of the term displacement acceleration is correct only in the transition point, that is to say when the colour changes from green to red. Acceleration means change of velocity. In the red sectors acceleration is different from zero only in correspondence to the point where the accumulated displacement starts to increase (i.e. decrease considering the negative sign). The effect of the acceleration is to change the slope of the curve: the velocity changes from zero, horizontal line, to an (roughly speaking) approximately constant positive value, inclined lines or change the slope. If the landslide maintains an acceleration, the velocity increases linearly with time and the accumulated displacement does not show a linear trend. So I suggest to refer to acceleration, only in correspondence to the point where the slope of the curve changes from zero to a positive value, using only lines and not coloured areas; analogously deceleration occurs when the slope decrease or ceases: the landslide does not

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move and the accumulated displacement is constant. The different coloured areas of the plot can only indicate the condition: landslide in motion/steady.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 7247, 2015.

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