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Interactive comment on "Big data managing in a landslide Early Warning System: experience from a ground-based interferometric radar application" *by* Emanuele Intrieri et al.

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Answers to Anonymous Referee #2 The authors submitted a work to present the role of GB-InSAR on an integrated system for landslide monitoring. In particular, the early warning system architecture and the data management are treated. The work is referred to the LEWIS project and it is focused on a critical infrastructure in southern Italy (A16 highways). Although the technology here presented is now well-known, the integration with other monitoring technique and the development of EWS are interesting topics. The objectives of the manuscript are clear and the paper covers an area of interest to the journal's readership. In order to improve the

manuscript, I recommend authors to summarize the section with irrelevant details for readers (eg. GB-InSAR features..) focusing on data analysis and interpretation, also by adding some displacement time series. The sections highlighted by the referee have been heavily reduced and 3 figures have been removed in total. Concerning the time series, we have not included them since these are not really meaningful. In fact, the slope did not experience significant movements and the growth of the vegetation produces noise that concealed the slightest deformations, which did not exceed the instrumental resolution (less than one millimiter per day). On the other hand, displacement maps (now figure 7) have been included, in order to show some displacement data nonetheless and to show that displacements were negligible. Indeed, as you rightly pointed put, the use of GB-InSAR for landslide monitoring is not new and it was not the aim of our paper. Our scope was to explain a procedure to overcome some logistic issues encountered in an early warning system, such as big data. We have added to better explain our scope in the abstract and in the introduction. They are reported below. In the abstract: "The aim of this paper is to show how logistic issues linked to advanced monitoring techniques such as big data transfer and storing, can be dealt with, compatibly with an early warning system. Therefore, we focus on the interaction between an areal monitoring tool (a ground-based interferometric radar) and the DCPC. By converting complex data into ASCII strings and through appropriate data cropping and average, and by implementing an algorithm for line of sight correction, we managed to reduce the data daily output without compromising the capability of performing." In the introduction: "One of the main drawbacks of advanced instruments such as GB-InSAR is how to handle the large data flow deriving from continuous real-time monitoring. The issue is to reduce the capacity needed for analyzing, transmitting and storing big data without losing important information. The main feature of this paper is indeed the management of monitoring data in order to filter, correct, transfer and access them compatibly with the needs of an early warning system." In addition, it is really important to improve the conclusions, also by focusing on data integration for EWS. Thank you for pointing out this issue. We improved the

conclusions by better explaining the possible usefulness of our paper with reference to similar situations. Unfortunately, we do not have data from other instruments; in fact, all the monitoring devices were independent and the integration was only needed at a higher level, when monitoring data and results from modeling were finally integrated and a risk assessment was possible. These aspects are already treated in other paper cited in the manuscript (Versace et al., 2012; Costanzo et al., 2015; 2016). In this paper, we only deal with the interaction between GB-InSAR and the DCPC. In fact, what happen next (e.g. data integration between GB-InSAR and other instruments) falls out of our interest and detailed knowledge. Following, some specific comments and minor points to improve the text: - Page 2, row 56: please replace "aerial" with "spatial" Done. - Page 2, rows 56-57: please replace "The installation was in an area where the only internet connection available 57 was 3G" with "the monitoring area was covered by a 3G mobile telecommunication networks" This sentence has been changed as suggested and it is now at the beginning of section 5, following the suggestion of referee #1. - Page 2, rows 61-83: these lines are very specific and of little interest to readers. Please consider deleting these lines or inserting them in Section 3.3. They have been deleted and only in small part moved. - Page 2, row 76: please change "where" with "were" This part has been removed from the paper. - Page 3, row 86: please change "ground-based interferometric synthetic aperture radar" with "Ground-Based Interferometric Synthetic Aperture Radar (GB-InSAR)" We have now changed this. - Section 3.1: this section appears too long. Please consider reducing sentences and adding a table with the technical specifications of equipment used (eg. Frequency, Bandwidth, Range and Cross-range resolution, etc.). Thank you for this comment. In fact this part was mostly a repetition and has been largely reduced. We also remove the part explaining the technical specifications of the equipment, since this information can be found in the literature cited in the paper and is not fundamental for our purpose. - Section 4: please add more geological information (eg. materials involved) to better frame the area under study. Now we have explained that "The lithologies outcropping in this area are Pliocene-Quaternary clay, clayey marlstones,

and more recent (Holocene) terraced alluvial sediments (from clay to gravel). The landslides shown in Figure 2 are all located in clay or clayey marlstones". - Page 8, row 250: please add space before "These" Done. - Fig. 1: please improve the quality of figure Now the text is bolder and the boxes are no longer filled with a gradient but with a solid color. - Fig. 3: please increase the font size The font size has been increased. - Fig. 8: please insert the location of GB-InSAR instrument installed. You are right. The yellow asterisk in the left of the images represents the location of the GB-InSAR. This is now specified in the caption of the image.

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2017-178/nhess-2017-178-AC2-supplement.pdf

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