

Interactive comment on “Brief communication: 3D reconstruction of a collapsed rock pillar from web-retrieved images and terrestrial LiDAR data – The 2005 event of the West face of the Drus (Mont-Blanc massif)” by Antoine Guerin et al.

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Response letter to the Anonymous Referee #1 of the NHESS journal – Guerin et al.: “3D reconstruction of a collapsed rock pillar from web-retrieved images and terrestrial LiDAR data – The 2005 event of the West face of the Drus (Mont-Blanc massif)”

The authors took into account all the general comments and required corrections by both reviewers in the new version of this Brief communication which has been well developed. We first try to quantify more precisely the different sources of errors that influence the estimation of the final volume and to relate them to each step of the method

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(number of photos taken into account, SfM method itself, scaling/alignment procedure and mesh smoothing procedure). The authors have also developed the section 2 “Material and methods” in order to clarify the different stages of data processing. Then, on the basis of the Fig. 3C, several illustrations have been added (Fig. 3E and 3F, Fig. 6) in order to better characterize the deviations resulting from the point-to-mesh comparison, particularly in stable areas. Furthermore, as proposed by the reviewer #1, a point density map was added (Fig. 3D) as well as Fig. 4 and Fig. 5, so as to better illustrate the methods of rockfall extraction and volume calculation. Finally, the four references suggested by the reviewer #2 have been incorporated into the manuscript. In italics below, you will find the answers to the questions you have asked.

Reviewer #1's questions

Page 1, row 27: “legendary climbing routes” is a term for “basecamp”, not for NHESD. We have removed the word "legendary" from this sentence (page 3, row 27).

Page2, row 12: city of Kathmandu, not Kathmandu city. This modification was taken into account in page 4 (row 14).

Page 3, row 22: when you mention neglecting the snow, do you ignore it completely or mask the snowy parts from the image? And if you ignore it, does it not affect the final image? Indeed, it was not very clear. . . For clarity, we replaced “However, snow is hardly present in the steep Drus faces and its influence can be neglected on the winter images.” by “However, in winter, snow is hardly present in the steep Drus faces and except at the foot of the cliff, there is no snow in the area of interest of the Bonatti Pillar on the 30 selected images.” (page 6, row 1-3)

Page 4, row 11: Mean density is not always a useful metric, especially if point density is very variable. Please specify the resolution of the final model, the standard deviation or add a point density map. If there are low density zones in critical areas that could affect the final result and become a significant source of error. As you suggested above, a point density map has been added (Fig. 3D) and the mean density of points per m2 in

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the area of interest of the Bonatti Pillar was specified in section 2.4 (page 7, row1).

Page 5, row 13: by relative error I assume you mean between your 3 SfM models? Yes in this paragraph, we are talking about the relative error between the 3 SfM models. This modification was taken into account in page 8 (row 32).

Page 5, row 22: what is normal about the difference? Do you mean it is expected? Yes, we wanted to say "expected". This modification was taken into account in page 9 (row 27).

Page 6, row 29: who are the Bisson brothers? The Bisson brothers are two pioneers of the French photography. This information was added at the end of the conclusion (page 10, row 21).

Figure 1b: The yellow unit is undefined. The geotectonic map of Fig. 1B (as well as the related references) has been modified following the advice of M. Jean-Luc Epard, Professor of Structural Geology at the University of Lausanne. All units are now well defined (page 15).

Figure 1d: should be "pre-1850", not "avant". This modification was taken into account in Fig. 1D (page 15).

Figure 3: should have a, b and c for easier referencing. This modification was taken into account in Fig. 3 (page 17).

Figure 4d: please add the dashed scar limit so the comparison with 4c will be easier. This modification was taken into account in Fig. 7D (page 21)

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-316/nhess-2016-316-AC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-316,

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