

P8 L5-20 : In this paragraph I think you want to cite Marc et al 2016 (JGR about landslide total area and volume) and not Marc et al 2017 (about affected area).

P11 : L20 – 25 : the comparison of the 2 equations is a bit misleading because you add 2 terms (anelastic attenuation , and Mw dependent geometric spreading c5), and shuffle the order : c3 becomes c4 in the second equation...

Why not writing the second Eq : $\ln(I) = c1 + c2M + (c3+c4M)\ln(r) + c6 r$

Also note that including anelastic attenuation has also been done in various studies (Meunier 2007, 2013, Yuan 2013) so it is not completely new. Nevertheless, I agree that it is often difficult to constrain the attenuation coefficient and thus, using geometric spreading only is often preferred.

P14 L 11: indicating a landslide failure process starting from the crown and according to simulations by Dang et al. (2016).

Sentence with a missing word ?

Fig 5 : Maybe indicate the Attenuation parameter obtained from the MLE exponential fit ?

P15: L 1-9: Unclear what is the main message or aim of this paragraph.

L1 Locations rather than localities ?

L1 “Propagated progressively” : What do you mean? Are you talking about rupture propagation (as suggested by the following lines) or about run out (I.e landslide downslope, rapid, motion after failure). Because unless you specifically restrict analysis to scar areas the “flatter areas” are likely deposit areas, related to runout termination not rupture propagation.

L10 : Mt. Aso and its caldera and Mt. Shutendo-ji had a high density of landslides (Fig. 5), whereas Mt. Kinpo and Mt. Otake lack landslides, though these locations are closer to the epicenter and at comparable distances from the rupture (Fig. 5).

Actually it is not so clear on Fig 5 (Aso is relatively low, similar to Otake). Referring to Fig 7 where the low spatial density is clearer (and adding Peak Names on this figure) may be better.

Figure 4 : This is a nice and standard figure. It may be worth to show the same figure done with the non EQ landslides ? That may be a simple to do supplementary figure that would show nicely if the trend in MAF is significant and due to the EQ (as there is no reason MAF should relate to rainfall induced landslides).

Fig 6 very nice figure

Fig 8: Density of landslide concentration is an awkward term. I guess it is the Kernel Density estimate of Landslide concentration (remind the unit of landslide concentration as in following figures)

P20 L2 :“depends on the ratio of rupture and shear wave velocity and the length of the rupture (Spudich and Chiou, 2008).“

Unless rediscussed later , it would be nice to know how : If fault length and rupture velocity indicates the potential importance of directivity for landslide pattern, it may be included in simple models.

Fig 11: On figure 11 I would have like to see the FN/FP in more details for the low frequency range.

Indeed, how much of the variations in the 0.1-1Hz range remain in the 0.5-1Hz range ? Because we may expect the PGV/PGA at 0.1Hz too weak to cause landsliding, compare to the one between 0.5 and 1 Hz.

If the authors can make it easily I would suggest they split the 0.1-1Hz range in 2 or 3 subplot, as it may yield useful insight for later studies on frequency effects on landslide triggering. Maybe as a supplementary figure, or as a few lines about the contribution of subranges of frequencies.

This is somewhat shown in Fig 10 but as far as I understood Fig 10 is model and Fig 11 is data. The text is somewhat unclear about that and does not call Figure 10, I think.

P25:L32:Maybe not so intractable : Using an estimate of landslide width, and expectations on landslide scar aspect ratio (Domej et al., 2017) the scar area can be estimated and the corresponding high elevation pixels can be extracted within each polygons. This requires high quality mapping where individual landslides are not bundled together. But this approach has been validated and shown to improve correlation with rainfall in Marc et al., 2018a, and shown to improve volume and erosion estimates in Marc et al., 2018b.

This is a side topic for your study, but it could be mentioned, and at least this statement may be more nuanced.

Fig 12 : I would say the caption can be simple and clearer as : a) Aspect and hillslope inclination distribution within areas of the earthquake triggered landslides. This distribution is normalized by the distribution of the aspect of all hillslopes in the landslide affected area

P21 L9 : This is an interesting and important point, but I would maybe rephrase it in terms of slopes. Because it is the slope that control the aspect of a landslide (that is what you measure on your DEM) and the earthquake is simply preferentially causing failures in some slopes (because wave motions and accelerations are stronger in some specific directions that will increase more or less the slope parallel component leading to failure). So the pattern of ground motion favor landslides in some part of the landscape, and at finer scale the directions of ground motions (FN/FP ratio) will force failure on specific slope aspects.

I would say a few lines discussing when and how different earthquakes will display strong directivity effect would be a good addition (maybe starting from your statement about Rupture speed and length ? Cf comment above).

P26 L18 : As commented above, Meunier 2007 (as well as Meunier 2013) consider landslide decay away from the source with a geometric and an exponential decay, similar to anelastic effect.

References used:

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Marc, O., Stumpf, A., Malet, J.-P., Gosset, M., Uchida, T. and Chiang, S.-H.: Initial insights from a global database of rainfall-induced landslide inventories: the weak influence of slope and strong influence of total storm rainfall, *Earth Surface Dynamics*, 6(4), 903–922, doi:<https://doi.org/10.5194/esurf-6-903-2018>, 2018a.

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Meunier, P., Uchida, T. and Hovius, N.: Landslide patterns reveal the sources of large earthquakes, *Earth and Planetary Science Letters*, 363, 27–33, doi:10.1016/j.epsl.2012.12.018, 2013.

Yuan, R.-M., Deng, Q.-H., Cunningham, D., Xu, C., Xu, X.-W. and Chang, C.-P.: Density Distribution of Landslides Triggered by the 2008 Wenchuan Earthquake and their Relationships to Peak Ground Acceleration, *Bulletin of the Seismological Society of America*, 103(4), 2344–2355, doi:10.1785/0120110233, 2013.