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Interactive comment on "Effects of finite source rupture on landslide triggering: The 2016 M_W 7.1 Kumamoto earthquake" *by* Sebastian von Specht et al.

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The paper analyzes the seismic effect on seismic landslide due to the propagation of seismic rupture during the 2016 Kumamoto earthquake in central Kyushu (Japan). This is an extremely meticulous and time-consuming process. The results have important implications for the regional seismic landslide development and hazard assessment research. However, there are some details that need further consideration and improvement. (1) In Figure 1 and 5, it is not obvious that Mt. Aso, its caldera, Mt. Shutendoji , Mt. Kinpo and Mt. Otake are near-identical conditions, particularly, the lithology, and topographic characteristics. (2) In Figure 1, it's true that the landslides triggered by

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Discussion paper

this earthquake are concentrated mainly inside the caldera and the flanks of Mt. Aso. But this area is also nearer the fault rupture patch with highest slip than other three areas. This means more energy could be released from this place during the earthquake. So the difference between distance effect and directivity effect needs to be analyzed. (3) This directivity effect results in larger shaking amplitudes in the rupture propagation direction variations in wave amplitudes and energy related to the directivity effect occur at lower frequencies. The paper shows the total landslide affected area is within 22.9 km distance from the rupture plane. In this near fault area, the effect of high-frequency seismic ground motion on landslide should be more important than the low-frequency. (4) The coseismic landslide is resulted in seismic load and slope geotechnical engineering conditions. This paper mainly makes an in-depth analysis from the engineering earthquake perspective, but the analysis of engineering geological factors is relatively rare. The conclusion is somehow different from some empirical knowledge. I suggest authors further analyze the influence of engineering geological factors. For example, authors can consider the physical and mechanical properties of rock-soil mass and DEM data with higher accuracy to analyze their correlation with landslide, and use quantitative indicators to describe the correlation. These may affect the results to some extent.

Specific comments 1. Figure 1. Add a map scale and identify the epicenter of the Yufu event. 2. The location of mountain peaks should be shown in figure 2a. The details in the four areas listed in figure 5 should be evidenced by zooming in. 3. Page 4. The map scale of the Seamless Digital Geological Map of Japan should be stated. 4. Page4. The computation process of fundamental frequency of hillslope section should be stated. 5. Page 8. Throughout the paper, no coseismic landslide displacement is calculated or used. I suggest delete this part. 6. Page 11. Many empirical attenuation relationships for Arias intensity are developed recent years. Why use the Kramer (1996) model here?

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