Technical Corrections

Morphological analysis of hummocks in debris avalanche deposits around Mt Erciyes, central Turkey

Yuichi S. Hayakawa et al.

Some technical corrections are given which I think would make it easier to understand some sentences y making them shorter and simpler. I recommend a review on sentence construction to get rid of repetitions of ideas within paragraphs and continuity of ideas presented.

Repetitions of ideas previously presented such as Page 1 Line 21; Page 7, Lines 28 to 30, pls see corrections below.

As much as possible, avoid using exact words in the the same sentence such as in Page 7, Line 4, delete the second "also".

If the information presented is important such as Page 16 Line 6 (deposition area), do not put in parenthesis.

Numbers, (1-10) used for counting are better spelled out such as in Line 6, page 9.

Sentences are complicated and too long, sometimes such as page 6, Lines 14 and 36, and page 9, lines 6, 19, 20, pls see below.

Too much use of "the" i.e. Line 13, page 15: "..entrainment during transport, volume…"

Add ® after softwares used such as Agisoft and ArcGIS

Page 1
Line 15: caused by volcano sector collapse often forms…
Line 16: including = such as; "Sedimentological and geomorphological analyses.."
Line 17: …and emplacement of debris avalanches. We describe the morphology of hummocks on the northeastern flank of Mt. Erciyes…
Line 19: delete (RPAS), (SfM) (DEM)
Line 20: high definition= high resolution; "…and orthorectified image of the hummocks"
Line 21: delete the sentence on "detailed geometric features…"
Line 22: We estimate the source volume of the DAD by…
Line 23: delete lower resolution; "For this, we examined the topographic cross sections based on slopes around the scar regarded as remnant …"

Line 24: Spatial distribution of hummocks is anomalously concentrated at a certain distance from the source, unlike those that follow the distance-size relationship.
Line 26: delete found to be
Line 27: These indicate that the flow and emplacement of the avalanche was storngly constrained by the caldera wall and regional fault system (?).
Line 30: The existing caldera wall forced the initial…
Line 32: Also, the estimated volume of 12-15.. gives a mean thickness
Line 33: could = must have flown far downstream and beyond the current DAD extent.
Line 37: have = are often observed
Line 38: "earthquakes, magma intrusion,…"
Line 39: delete "highly; " …mass movement involved, that appears…"
Line 40: delete "to widespread areas"
Page2
Line 1: "Furthermore, sector collapses can repeatedly occur on the same volcano after regrowing an unstable flank…"
Line 3: "…caused by a volcanic sector collapse forms…"
Line 4: including = called, composed of; among = within a matrix.
Lines 4-5: what do you mean by "originated from the pre-existed mountain body? Do you mean, the materials that make up hummocks?
Line 19: front of the DADs= flow front
Line 20: hummock size is often in the order of tens to hundred sof meters in size, so aerial photographs are often used for their identification and morphological analysis.
Line 22: ie=within 1-5 m resolution
Line 25: "'DEM can also be used for the analysis of hummocks but the acquisition cost is often…
Line 27: Due to availability, details of many known DADs remain unexamined.
Line 33: delete "data of"; "… On-site acquisition of high resolution topographic and imagery data using RPAS is cost efficient. Although. Aerial…. "
Line 38: "Using the combined RPAS and satellite-derived topographic data, we acquired high resolution morphological data of the hummocks on the northeast flank of Mt Erciyes, previously described by Sen et al. (2003). We also utilized medium resolution topographic data at 10 m resolution from satellite SAR imagery for the analysis of the surrounding areas. The volume of the DAD crucial for describing the sector collapse was obtained by reconstructing the original topography of the source area."
Page 3
Line 10: The youngest deposit is the DAD, emplaced after 83 ka (Sen et al., 2003). Moraines that formed in the last glacial maximum (21.3 ka) are also present within the valley along the avalanche flow. This gives an approximate age of the sector collapse of between 20-80 ka.
Line 14: The DAD is observed within…. Valley, covering an area of ~14 km2.
Line 15: The downstream extent, however, is hard to identify due to limited exposure, and erosion and remobilization of DAD after emplacement, particularly in the fluvial valley.

Lines 22-25: Baed on the collapse scar, the debris avaalnche was supposed to be flowing to the east (A inFig. 1, 2A). The flow then turned to the north due to confinement by pre-existing caldera walls. The present lake that serves as a reservoir is possibly a remnant of a dammed lake.
Line 30: delete However; delete some
Line 31: were found to be = are
Line 34: Mt Erciyes along the north-northeast direction
Line 35: ..fault activity, however, are not well known.
Line 36: ~400mm, resulting in scarce vegetation. Climatic…
Line 38: delete the climate
Page 5
Line 3: (a) Collapse scar of Mt Erciyes, photo taken westward. On the foreground is where the avalanche has changed direction from east to north.
Line 5: (b) Mt Erciyes and the hummocks on the foreground; delete "on the UAV, approximately"; "…~30 m high"
Page 6:
Line 1: Aerial view of hummocks in b, taken by UAV with diameter of ~150 m. (e) Exposed internal architecture of a hummock along a road.
Line 2: delete "the", change "just below the" into "past the"
Line 14: UAV flights at relatively high elevation were carried out in and around the hummock area.
Line 17: A flight of ~10 to 20 minutes take 300-600 photographs.
Line 18: delete "also"
Line 19: change "whose" to "with log.."
Line 20: delete are
Line 22: "photographs were also selected as GCPs, including road intersections, flat stone surfaces on bridges..
Line 23: change "to be the" to "to"
Line 26: is = was; delete "the" before "multiple photographs"
Line 36: "…we traced the hummock bases using ArcGIS…
Page 7:
Line 7, delete "very"
Line 9: delete "the" hummocks are then examined in GIS and area is calculated for each polygon"
Line 10: "…each hummock by interpolating…."
Line 28: As background topographc and imagery datacovering areas wider than the RPAS-derived data, we used AVNIR-2 (…), a satellite based imagery and PRISM (…) mounted on ALOS (…) satellite.
Line 32: "resolution of 10 m. These data is too coarse for hummock extraction but can be used as a background data."
Page 8
Line 1: "…data was to confirm the hummocky topography in…"
Line 3: "…was processed to generate a 3 m resolution DEM, but is resampled to 10 m resolution to avoid surficial…
Line 20: supposing = assuming
Line 26: reconstruct "according to the linearly of the slope cross section"

Line 38: “Reconstruction of the original topography by linear and Bezier methods, used 3-dimensional TIN models.”
Page 9
Line 6: There were eight UAV flight that took 2,900 photos. Of these, 1,572 were used for photogrammetry.”
Line 19: “The outline of hummocks were then traced from the RPAS-derived DEM and…”
Line 20: change the sentence into “65 hummocks were extracted, all are within ~11 to 13 km away from the DAD source.”
Page 13:
Line 10: “The limited distribution and concentration of hummocks only in the area 11-13 km from the summit and the downstream increase in hummock area, suggest that the distance-size relationship does not work for Mt Erciyes DAD.”
Page 16
Line 3:change “roughly-estimated” into “rough estimation of the”
Line 4: delete identified “…previously mapped by Sen et al. (2003)”
Line 6: …depositional area of 20 km2. The mean thickness of the DAD is ~60-75 m.
Line 9: delete “and the DAD thickness for” …Mt Erciyes for DAD thickness
Line 10: delete “potential”
Line 11: delte “in the downstream areas”
Line 12: change “down” to “downstream
Line 13: change “with the” into “where elevation is lower than ~1500 m”
Line 15: “Based on the plots in Fig. 9, the distance-size relationship for Erciyes…”
Line 21: Delete “it should be noted that”
Line 23: …sector of the mountain body, with some blocks preserving the original structure that appear as…
Line 24: …dposition in the upstream…
Line 31: delete “existed”; change” could have been hidden by such the
Page 17
Line 2: …might be slower as it entered the valley…
Line 3: delete “wall”
Line 11: delete “as noted”
Line 12: … hard to find the extent…
Line 15: delete “also”
Line 24: “being blocked”
Line 30: change “DAD of Mt Erciyes, and” into “Mt Erciyes DAD”.
Line 31: “Detailed”; delete on the DAD; delete successfully
Line 33: change “by the sector collapse of” ino “at”
Line 34: delete Also, The… the original topography (change “in”) of the source
Line 35:…DAD is difficult to trace, the estimated volume of ~12-15…
Line 36: delete “far”; delete “or observed”
Line 37: delete “present”; delete “extent”; suggested = suggests
Line 38: “…dynamics of”
Line 39: … debris avalanche emplacement and formation of hummocks
Line 40: the debris avalanche as it confined the flow; change “might” into “can”
Page 18

Line 1: change “course” into “path”; change “including” into “as”
Line 2: change “be examine” into “considered”; change “estimate in the case” into “estimation”
Line 3: collapses; changemay into can