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Interactive comment on “Tracing the boundaries of Cenozoic volcanic edifices from Sardinia (Italy): a geomorphometric contribution” by M. T. Melis et al.

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Received and published: 25 June 2014

Comments for ESurf by Dr. Ian S. Evans, Durham University, on – Tracing the boundaries of Cenozoic volcanic edifices from Sardinia (Italy): a geomorphometric contribute M. T. Melis, F. Mundula, F. Dessì, R. Cioni, A. Funedda GENERAL: The motivation, to define landforms morphometrically for legal conservation purposes, is innovative. The Grosse method of relative slope and curvature is modified from adding the two components (eq. 5) to multiplying them (eq.8). It is suggested that, for the 13 Sardinian features studied, this produces some improvement in delimitation. In Eq. 8, the factor $(1-f)$ multiplies the product of normalized slope and normalized curvature, so it is

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just a constant – varying f should have no effect on relative results: please check (you have not varied f . . .). This differs from the Grosse method, where f varies the weight of normalized slope. Both eq. 5 and eq. 8 – both main methods – will produce different results depending on the area for which max and min are calculated. This must be stated: it is crucial that it should be comparable, between different features to be compared. P3 lines 17-19 It is not clear why the first approach was unsatisfactory: reword. Section 2.2: is the switch here from ‘volcanic edifice’ to ‘volcanic landform’ deliberate (cf. introduction)? An important point is that when slope is multiplied by curvature, a zero result does NOT just mean ‘horizontal planar’ ; it can mean zero curvature on a steep, straight slope. On page 7, I am not convinced that average gradients (within) are relevant to delimiting features. Are you? Figure 4 and 6 strongly suggest the influence of the original contours, on the curvature calculation. If this is not avoidable by better processing of the DEM, it should at least be discussed. How would the maps look if a non-contour-based DEM were used? The paper would be improved by a more thorough comparison of the additive and multiplicative methods, e.g. replace the final figure with one showing the two outlines for all the 13 edifices, plus the geological boundaries: scale would have to be larger than Fig.7 Also more explanation of differences between results from the methods (I would give little space to the inferior S/TC method), and a fuller account of how a compromise is reached between morphometric and geological (lithological) boundaries), would make this a stronger paper.. Spell out where manual intervention is still necessary. This is a useful contribution, for which the expression and presentation should be improved. DETAIL: The English is a little strained in parts, e.g. Title and line 10: for ‘contribute’ read ‘contribution’ P1 lines 17-18 not ‘allows to recognize and tracing the’ but ‘permits recognition and tracing of the . . .’ P2, l 23 (2/23) ‘In their . . .’ 3/2 delete first) 4/9 ‘trending N-S’ ‘Island with the’ 4/17-18 ‘associated with the’ 4/23 delete ‘in’. Use proper +- symbol, \pm 4/31 ‘over a few’ 5/1 ‘elevated . . . metres above the . . .’ 5/12 ‘orthophotos’ 5/19 ‘centers’ is American spelling. 6/5 ‘a DEM’ [probably. . .] 6/23 ‘with respect’ 6/25 ‘concave’ at the base, not ‘convex’ ??? 6/27 ‘landform’ 7/3 ‘the literature’ 7/7 ‘horizontal or planar’ 8/18-22 split this com-

plex sentence. 10/6 'Constraints' 10/11 'grown' 10/12 delete second comma 10/20 'represents a major constraint' 11/22-23 'because', not 'in reason' 13/15 'features do not' 17/7 and 9 remove underlining. 20/1 'with the basal area and the. . .' And replace , with . in Tables 1 & 2. 20 Why is Table 2 needed, as a table? 22/3 'Table 1' 23/4 Explanation of the legend colours is needed – in this caption. 25/3 'of the modified Grosse method' [and elsewhere. . .] The English is comprehensible, but would benefit from further editing for proper use of definite and indefinite articles and reduced use of infinitive (that is excessive). Commas are not well used, and I do not think 'elaboration' is the right word for these methods

Interactive comment on Earth Surf. Dynam. Discuss., 2, 357, 2014.

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