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Potential impacts of robust surface roughness indexes on DTM-based segmentation

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In this study, we explore the impact of robust surface texture indexes based on MAD (median absolute differences), implemented by Trevisani and Rocca (2015), in the unsupervised morphological segmentation of an alpine basin. The area was already object of a geomorphometric analysis, consisting in the roughness-based segmentation of the landscape (Trevisani et al. 2012); the roughness indexes were calculated on a high resolution DTM derived by means of airborne Lidar using the variogram as estimator. The calculated roughness indexes have been then used for the fuzzy clustering (Odeh et al., 1992; Burrough et al., 2000) of the basin, revealing the high informative geomorphometric content of the roughness-based indexes. However, the fuzzy clustering revealed a high fuzziness and a high degree of mixing between textural classes; this was ascribed both to the morphological complexity of the basin and to the high sensitivity of variogram to non-stationarity and signal-noise. Accordingly, we explore how the new implemented roughness indexes based on MAD affect the morphological segmentation of the studied basin.

References

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