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Earth Surface Dynamics Discussions

Interactive comment on "Topographic roughness as a signature of the emergence of bedrock in eroding landscapes" *by* D. T. Milodowski et al.

Anonymous Referee #1

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This is an interesting, challenging and well-written paper. Surface roughness analysis through high-resolution topography probably is one of the most useful approaches for understanding the surface geomorphic signature of processes. I haven't major issues to raise, just minor points. I would like to bring to the authors' attention to the papers published along similar lines that are missed in the proposed literature review. I believe that presenting the current work relatively to other similar developments enlarges its perspective. Here a summary:

1) The Evan's 1980 approach was not just applied in Hurst et al. 2012, but also in several others works (i.e. Pirotti and Tarolli, 2010; Tarolli et al., 2012; Lin et al., 2013; Sofia et al., 2011, 2014), using also larger moving windows.

2) The surface roughness calculation from a DTM, using high-resolution topography

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derived by LIDAR, was also proposed in Cavalli et al. (2008). These authors calculated the surface roughness as the standard deviation of the residual topography (elevation and slope) within a n-cells moving window.

3) The scale effect is an issue underlined by multiple authors (i.e. Pirotti and Tarolli, 2010; Tarolli et al., 2012; Lin et al., 2013; Sofia et al., 2011, 2014). As well, other works dealt with the scale issue and errors connected to the use of the Evan's 1980 equation (Albani et al., 2004; Sofia et al., 2013). They showed that the smallest window sizes were the most affected by errors.

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