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

Received and published: 24 June 2015

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

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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