A new approach to obtaining slope reference field values applicable to Digital Slope Model accuracy evaluation

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SUMMARY

Modern Digital Elevation Models (DEM) are thoroughly examined, even beyond the accuracy of the raw height data. Recent initiatives have incorporated consideration of their performance with slope, roughness, etc., all aspects relevant to its quality. According to the standards, any accuracy evaluation must be made by comparing the dataset with a reference source having at least three times better accuracy. The problem with slope is that there were no field procedures capable of ensuring the required accuracy. This paper presents a proposal based on field measurements of height in a local network of equilateral triangles, with sides equal to the cell size of the regular square mesh to be controlled. An analytical demonstration shows that estimating slope from heights measured over a triangular mesh yields errors at least three times smaller than those from current methods using square cell meshes. Experimental results are presented.
