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Comment

Interactive comment on "Shadow analysis of soil surface roughness compared to the chain set method and direct measurement of micro-relief" *by* R. García Moreno et al.

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General comments

The paper describes a new approach to very ancient and important problem which can be resumed in the following question: "How tall is the pyramid of Cheops?" (Srinivasan, 2003). Srinivasan (2003), in his contribution to "Elements of Computational Metrology", has exemplified two more successful historical solutions for this problem:

I. "Measure the length of the pyramid's shadow when your own shadow exactly equals your height." (Thales, ca. 600 B.C.). Three major methodological problems are derived from this solution for shadow analysis which must be taken into account during the

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measurement design:

1. The shadow's attribute to be measured should be clearly defined (the length of pyramid's shadow in our example);

2. The Sun position should ensures that "your own shadow is exactly equals your height", that means that reference length or height values must be selected with special care. From the Abstract to the Conclusions of the useful and interesting paper of R. García Moreno et al., the authors are speaking about "shadow analysis", "micro-topographic shadows", "the measurements" etc. but I was not able to find what was really measured in this work. Of course, I can imagine it (The percentage of shadows?, The histogram?), but it is better to put in clear whit shadow's attribute was measured and how these procedures were accomplished. The authors should describe clearly and step by step the used methodology.

The light position during the shadow analysis is specified well for the laboratory conditions. But, in the field, what does it means "to simulate the daylight angle at a fixed daytime and conditions that prevail in the field at the same time each day"? From my point of view this aspect must be clarified before this paper will be accepted for publication. At least the authors are invited to be as clear as Thales de Mileto was ca. 600 B.C.

II. The second solution to the problem deals with the paper of R. Garcia Moreno et al. was presented by Srinivasan (2003) in generic sense, taking the example of Fourier's works. Fourier (ca. 1800 A.D.) wrote: "Add the measured heights of each of the 203 steps. Its uncertainty is 14 times the uncertainty in measuring a single step". R. Garcia Moreno et al. all time are speaking about the "statistical indexes SD and CV" of shadow distribution but, for me, first of all, is unclear how they measured these indexes for shadows, and, finally why they used SD and CV if both parameters are strongly correlated? So, which additional information they are looking for analyzing these two parameters and, maybe it is sufficient to use one of them? The authors must explain

the both underlined questions before the paper will be published.

Specific comments

I found a lot of fuzzy concepts which will be better, from my point of view, to put out of the article. For instance, the exclamations like "excellent indicator of soil susceptibility" seem not to be adequate for modern scientific language. Some neologisms as "multi-scalar" and "soil particles emission and saltation" is better to substitute by "multiscale" and corresponding concepts of erosion theory. The whole English writing, from my point of view, requires improvement.

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