# Statistical analysis of topography of Isvika Bay, Murchisonfjorden, Svalbard

#### Mateusz Moskalik and Robert Bialik

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September 15, 2010



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# Talk Outline

- Introduction
- Study area and measurements techniques
- Results of statistical analysis
- Conclusions and future work

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PERGAMON

Chaos, Solitons and Fractals 19 (2004) 427-439

www.elsevier.com/locate/chaos

#### Mars topography: bulk statistics and spectral scaling

V. Nikora \*, D. Goring

Mathematical Geology, Vol. 37, No. 4, May 2005 (© 2005) DOI: 10.1007/s11004-005-5952-4

> Central European Science Journals

Acta Geophysica vol. 54, no. 1, pp. 102-112 DOI 10.2478/s11600-006-0009-8

Martian Topography: Scaling, Craters, and High-Order Statistics<sup>1</sup>

Vladimir Nikora<sup>2</sup> and Derek Goring<sup>2</sup>

Spectral scaling in Mars topography: effect of craters

Vladimir NIKORA and Derek GORING



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Study area and measurements techniques



Figure: Index map indicating the study area on the southeastern side on Murchisonfjorden, Vestfonna, Svalbard



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Figure: Maps of the cell-scale statistical moments of surface elevation: mean and variance



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Figure: Maps of the variance in logarithmic scale and map of the inclination slope



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Figure: The joint and marginal distributions of the variance in logarithmic scale and slope inclination



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Figure: Maps of the cell-scale statistical moments of surface elevation: skewness and kurtosis



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Figure: The joint and marginal distributions of the cell-scale skewness and kurtosis coefficients for topography of Isvika Bay



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Figure: The joint and marginal distribution of the cell-scale skewness and kurtosis coefficients for Mars topography (Nikora and Goring, 2004)



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Figure: Comparison of the joint and marginal distributions of the cell-scale skewness and kurtosis coefficients for Mars topography and f Isvika Bay



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Figure: Typical exemplary surface profile



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#### Figure: Typical exemplary surface profile



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# Concluding remarks

1. Such a study may help in verifying a methodology for identification of morphological forms and analyzing a leading mechanism in topography development;



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- 1. Such a study may help in verifying a methodology for identification of morphological forms and analyzing a leading mechanism in topography development;
- 2. It is expected that the future depth studies and measurements in more complex regions will shown the unknown but suspected fractal structure of the topography of Earth surface in the Polar regions



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- 2. It is expected that the future depth studies and measurements in more complex regions will shown the unknown but suspected fractal structure of the topography of Earth surface in the Polar regions
- 3. The proposed analysis may provide enough information about processes forming planetary surface in local as well as global scale



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$$A = \frac{Max - Min}{Area}$$

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Introduction

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