



An areomorphometric visualisation and evaluation tool for HRSC DTM-derived local slope histograms

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In the last years morphometric study of Martian surface has become a primary research field. The various surface processes shape the Martian landforms creating a diverse spatial relief pattern. The diversity of the surface can be captured via the quantitative analysis of local slope angle histogram parameters.

Several complete HRSC orbit DTMs have been converted to a series of local slope histograms calculated for 4x4 km spatial window, including the Nanedi Valles region.

Our goal is to outline the different areomorphological units based on the statistical parameters of the slope distribution. To this end, a visualization program code was developed that allows to render the parameter maps like amplitude of the mode, skewness and standard deviation of the distribution as RGB-(red, green, blue)-coloured pixels, resulting in a colour image. In this image map the different colours represent very different types of slope histograms. The individual morphological types, regions (e.g., the valleys, in some cases, valley floors and valley sides, and crater rims) can be clearly distinguished from the surrounding plateau-like, low-relief areas.

This approach is also applicable for the aforementioned individual channels (colours), because the spatial changes in some cases are also visible, certain parameters have characteristic spatial trends, e.g., in the case of skewness the sides of the vallis a remarkably apparent.

The detailed evaluation of these image maps may help in automated classification of the areomorphometric domains.

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