gungen der beiden Einheiten nördlich und südlich der SEMP möglich. Weiters wäre es möglich, dass phreatische vorflutgebundenen Höhlen existierten, aber mit Sediment verfüllt wurden. Aufschlüsse verfüllter Höhlen scheinen südlich der SEMP häufiger zu sein. Dies würde ehemals unterschiedliche sedimentäre bzw. hydrologische Bedingungen beiderseits der Störung bedeuten.

Determination and shape analysis of selected Terrestrial and Martian geomorphic features derived from high resolution DTMs

PODOBNIKAR, T.[1, 2], DORNINGER, P.[1], SZÉKELY, B.[1, 3] & JANSA, J.[1]

[1]Christian Doppler Laboratory Spatial Data from Laser Scanning and Remote Sensing, Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Gußhausstraße 27-29, A-1040 Vienna, Austria; [2]Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Novi trg 2, SI-1000 Ljubljana, Slovenia; [3]Space Research Group, Department of Geophysics and Space Science, Eötvös University, Pázmány Péter sétány 1/a, HU-1117 Budapest, Hungary; tp@ipf.tuwien.ac.at, pdo@ipf.tuwien.ac.at, bs@ipf.tuwien.ac.at, jj@ipf.tuwien.ac.at

The purpose of the study is the investigation of automated methods for the determination and shape analysis of morphological features. The methods' focus is the detection of peaks and pits (sinks) and the recognition of selected types of shapes. Additionally, some non-typical cartographic visualisation techniques aiming at the enhancement of morphological details were developed. The proposed methods allow for enhanced quality control and subsequent DTM quality improvement. Hence, the interpretation of terrain features for various applications may be supported.

The first part of the study focuses on detecting areas of peaks and pits (regional extremes) and describing their shapes. The determination of significant regional extremes, comprising more than one local property, is a more challenging task. To solve this task, we propose automated algorithms to deal with the topographic and morphological criteria properly. The points and potential surfaces of the regional extremes are calculated and shapes are identified. Advantages of the automated approach are that the parameters are standardised and the results are more comparative, more objective, and therefore of higher quality. The proposed techniques are compared with the techniques for the peaks detection with local histograms.

The second part introduces some enhanced visualisation techniques that are based on extracting selected morphologic characteristics of a landform. We propose visualization techniques that can be grouped as follows: relative relief modelling, enhanced height-coding including local approaches, techniques for the enhancement of edges or other morphological features enhancement. Furthermore, we propose DTM generalisation and multiscale presentation for visualization purposes. A combination of the proposed methods in various scales may improve reading and interpretation of landform features. Possible by-products are: objective DTM analysis, DTM quality improvement; support in DTM interpretation; possibility of application in education; and increase of the public awareness on environment.

Selected areas on the Mars have been investigated using DTMs determined from HRSC images and MOLA data in the areas of Candor Chasma and Nanedi Valles. For the calibration of the parameters the following areas on the Earth were analysed in previous stages: San Francisco volcanic fields in Arizona, Vorarlberg, Austria and Kamnik Alps in Slovenia. As the morphological features on Mars are often different compared to the Earth, the acquired knowledge from Mars will help to better understand the Earth's characteristics, and can be therefore used for better modelling the DTMs on Earth.

An attempt of analysis of the potentially hazardous detrital cones (fans and talus cones) with DTM in Alpine areas

PODOBNIKAR, T.[1, 2] & SZÉKELY, B.[1, 3]

[1]Christian Doppler Laboratory Spatial Data from Laser Scanning and Remote Sensing, Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Gußhausstraße 27-29, A-1040 Vienna, Austria; [2]Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Novi trg 2, SI-1000 Ljubljana, Slovenia; [3]Space Research Group, Department of Geophysics and Space Science, Eötvös University, Pázmány Péter sétány 1/a, HU-1117 Budapest, Hungary; tp@ipf.tuwien.ac.at, bs@ipf.tuwien.ac.at

In alpine settings where the topographic evolution is mostly driven by post-glacial geomorphology, the analysis of digital terrain data has attracted much interest. Unstable valley slopes are often covered by detrital cones (fans). In these areas the scree slopes are often unvegetated, however in some settings of young forests or shrubs may cover them. Less active and often settled fans that are analysed in this study are characterised with less risk potential.

Identification of the fans has been carried out by introducing appropriate spatial variables derived from a high quality DTM (e.g. slope, relative relief, aspect, curvature, etc.). The combinations of different variables by modelling in GIS environment enable outline the potential areas of fans. The output may be twofold: On one hand the detection of the potential talus cone areas that are important for geomorphic assessment. The second aspect is the visualisation of the terrain surface with enhanced terrain structures in order to provide easy-to-read maps of the fans including explanatory text that increases public awareness on the possible natural hazards.

The preliminary results of calculations are promising. Map algebra operations of sectorial parameters yielded the best results. The vast majority of the talus area has been categorized by the method to the correct category. The misclassifications are relatively rare, and they appear rather as single points, than in extensive patches. It seems that later they can be removed applying a simple filter. Although we present here the results of relative small test areas, the method works also in larger extents as well. On the other hand the processing of larger area needs more preparation time of the operator, since misclassifications may occur. Especially if various lithological classes are present in the area to be processed, the results cannot remain always stable, because the modelling may turn to be selective in the area of one lithology, and in the area of another rock type the classification selects too many or too few points. This behaviour should be eliminated in operational environment.

The Tonalitic lamellae along the Giudicarie Fault System

POMELLA, H.[1], FÜGENSCHUH, B.[1] & STIPP, M.[2]

[1]Institute of Geology and Paleontology, University of Innsbruck, Innrain 52, A-6020 Innsbruck; [2]IFM-GEOMAR, Leibniz Institute of Marine Sciences; Wischhofstr. 1-3, D-24148 Kiel; Hannah.Pomella@uibk.ac.at, Bernhard.Fuegenschuh@uibk.ac.at, mstipp@ifm-geomar.de

The NNE-SSW striking Guidicarie Fault System (GFS, composed