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Laser scan of the Grimming Mts. (Austria) with the latest LiDAR VZ-4000 equipment: preliminary results

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As part of a cooperation project between OMV, RIEGL and the University of Vienna the new LiDAR (Light Detection and Ranging) VZ-4000 laser scanner was tested at the Grimming Mts. of the Eastern Alps in Austria. The prominent Grimming Mts. lies in the eastern part of the Dachstein Massif at the southern margin of the Northern Calcareous Alps. The Grimming, with a peak of 2,351 m above sea level, is one of the highest isolated mountains in Europe. Because of its spectacular topography, the Grimming has been used as an important surface reference mark since 1822. From a structural geology standpoint, the Grimming forms a huge antiform made up of dominantly well-bedded Triassic Dachstein Limestone. Because of the relatively well exposed bedrock surfaces above the tree-line and the fairly complex internal structure, the Grimming Mts. provides an ideal target for testing new high resolution laser scan techniques and devices. The maximum distance from the scanning positions on the nearby valley floor to the mountain face was about 4,500 m and the generated point cloud has an average resolution of 25 points per square meter. The purpose of this work was to test the latest version of the high resolution LiDAR laser equipment in a setting which falls beyond the capabilities of most existing LiDAR devices. The results of the pilot study include high-resolution spatial data on bedding planes, fault planes and the thickness variations of individual beds within the Dachstein Limestone. For the first time, the data obtained can be directly used to generate the proper 3D geometry of folds and faults observed on the Grimming Mts. This leads to a modern understanding of this prominent Alpine anticline in terms of structural geology.