mit einem Voxel-Ansatz dreidimensional interpoliert. Dabei zeigten sich ein stark reliefierter Untergrund sowie Tiefenbereichen, die deutlich lockerer gelagert sind und mögliche Fließwege am Hang markieren können. Ihr Verlauf konnte in einen direkten räumlichen Bezug zur Rutschung und ihrer aktuellen Weiterbildung gebracht werden. ? Aus den unterschiedlichen Strukturen der Tiefenverläufe der Rammwiderstände lassen sich noch weitere Prozesse am Hang ableiten.
Ergänzende Untersuchungen gelten dem Monitoring der aktuellen Weiterbildung der Rutschungen, dem Bezug von Oberflächen- und Untergrundrelief an unterschiedlichen Hangbereichen, der Ermittlung von geotechnische Parametern sowie dem Vergleich der Sondierungsdaten mit Georadar-Messungen.

Self-Noise and Sensitivity of Broadband Seismograph Stations

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Technical improvements of seismic sensors and data loggers have facilitated the use of weak seismic signals and seismic noise for studying the Earth, as it is done in various applications of ambient noise interferometry, when using seismic recordings to characterize parameters of ocean winds and waves, or when investigating Earth's normal modes.
As the seismic sensor itself produces noise, it is important to determine its self-noise and sensitivity in order to assess its suitability for a given purpose as well as its general functionality.
A method to estimate the self-noise of seismic sensors has been proposed by Sleeman (Sleeman, 2006), involving the correlation of seismic noise recorded by triples of collocated and coaligned sensors. The accuracy of this method, however, is known to strongly depend upon the precise alignment of the sensors, which may be difficult to achieve in many cases. We investigate the influence of a rotation of the horizontal seismic traces on apparent sensor self-noise in order to correct possible misalignments, and thus find true self-noise estimates.
We further report that using RefTek-instruments (151-60A, RT-130), we were able to resolve Earth's normal modes up to periods approximately ten times their eigenperiod of 60s.

Visualisation of landslide deformation directions using range flow motion constraint applied on LiDAR data

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As in many environmental applications the change monitoring of the geomorphic surface is important on various timescales. Increased or sudden erosion (e.g. gully head retreat), sedimentation and, especially mass movements are important not only from the point of view of surface processes, but they may have severe impact on human environment or, in extreme cases they may even endanger property or human lives. The latter possibility verifies the efforts invested in change detection, and prediction of estimations on rates of such processes.
For the study of a landslide spatially and temporally resolved analysis is required. Because of the ability to derive dense flow fields, the range flow algorithm developed in the computer vision industry was tested for our study area situated at Doren (Vorarlberg, Austria). Several epochs of airborne and terrestrial laser scanning data were available, of which the 3D velocity fields of a moving surface has been computed using the range flow algorithm. The surface of the landslide (the DTM) is a function of the spatial location and time. If the determination of the local velocities is successful, a vector field is resulted with the 3D motion rates. At some places the determination of 3D velocities cannot be performed; these problematic areas originate as a result of vegetation filtering, large deformation of the surface, erosion and artificial roughness caused by human activity. It is essential that these areas are automatically identified and filtered out to avoid the computation of erroneous flow vectors. The accuracy of the unknowns gives the quality of velocity estimates from least squares solution. An empirically determined threshold is used to check for these areas.
The results for certain, vegetation-free areas are very inspiring: both the horizontal and vertical vector maps seem to be reliable. However, in some cases the aforementioned factors hampered the determination of the vectors with the required accuracy.
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Mn^{2+}-allanite and rare Co-Ni-As sulfides from the Veitsch Mn deposit (Styria)

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Several carbonate-hosted Fe and Mn ore deposits occur within the upper Austroalpine Grewywacke Zone. The Mn deposit of Veitsch at the Kaskogel and north of the Friedelkogel consists of lense-shaped carbonate bodies of ca. 1.5 m in length which are thought to have formed as sedimentary or submarine hydrothermal Mn-deposits. The manganese silicates described from this deposit are: tephroite, pyroxmangite, spessartine, Mn-chlorite, Mn-humite and friedellite. Sulfides such as sphalerite, galena, chalcopyrite and Co-Ni sulfides also occur.
During this investigation in several samples an unusual REE-Mn-(V)-bearing allanite mineral was found. The allanite occurs in a veinlet with the mineral assemblage REE-Mn-allanite + tephroite + spessartine + Mn-chlorite + rhodochrosite + kutnahorite + serpentine. The REE varies between 1.5 and 1.8 a.p.f.u., and Mn ranges from 1.2 to 1.5 a.p.f.u. In one sample elevated V contents of 1.3-7 wt.% V_2O_3 were observed. The BSE images and chemical analysis reveal a complex zoning of the mineral with increasing Fe_2O_3, MnO and decreasing Al_2O_3 and CaO towards the rim, whereas the REE are unzoned except for V-bearing areas. Charge balance considerations and site assignments indicate that the fraction of Mn^{3+} is very low (<0.2 a.p.f.u.). With such low Mn^{3+} the mineral is a REE-Mn^{2+}allanite [$CaREE(Mn^{2+})(Al,Fe^{3+})2Si_3O_{12}(OH)$], with some androsite [$MnREE(Mn^{2+})(R^{3+})2Si_3O_{12}(OH)$], dissakisite [$CaREEMgAl_2Si_3O_{12}(OH)$], but little or no allanite [$CaREE(Fe^{2+})Al_2Si_3O_{12}(OH)$] component. The elevated F contents of 0.14 to 0.23 a.p.f.u. indicate that a khristovite component [$CaREEMgMn^{2+}AlSi_3O_{11}(F,OH)(OH)$] may also be present.
The complex accompanying sulfide assemblage contains chalcopyrite, pyrite, bornite, digenite, sphalerite, Co-pentlandite and rare Co-Ni sulfides such as linnaeite, carrolite and three so far unidentified Co-As sulfides.

Postglacial denudation and sedimentation in an inner-alpine headwater catchment (Gradenmoos Basin, Schober Mountains, Austrian Alps)

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Knickpoints in alpine stream profiles frequently refer to different lithologic and tectonic units of a catchment, to damming effects through large rockfall deposits, or to the impact of Pleistocene glaciations. As a consequence of glacial overdeepening, various sedimentary sinks developed in alpine drainage basins effectively interrupting postglacial sediment fluxes. In recent times these sinks have been filled up to different degrees with sediments from various sources. The sedimentary record and volumes of sediment storage within these (semi-) closed systems are of great value for the reconstruction of postglacial landscape evolution.
This study investigates the glacially overdeepened Gradenmoos basin an alpine lake mire with adjacent floodplain deposits and surrounding hillslope storage landforms (1920 m; 4.1 km2) - the most pronounced sink in the Gradenbach catchment (32.5 km2, Schober Mountains, Hohe Tauern, Austria). The basin has been filled up with sediments delivered by mainly fluvial processes, debris flows, as well as rockfall and avalanche activity, it is deglaciated since Egesen times and it archives a continuous postglacial stratigraphy. Following the approach of denudation-accumulation-systems, most reliable data on denudation and sedimentation are obtained (1) if sediment output of a system can be neglected for an established period of time, (2) if - due to spatial scale - sediment storage can be assessed with a high level of accuracy, (3) if the onset of sedimentation and the amount of initially stored sediments are known, and (4) if sediment contributing areas can be clearly delimited. All aspects are fulfilled to a high degree within the studied basin.
Sediment storage in and surrounding the basin was quantified using geophysical methods, core-drillings, as well as GIS and 3D-modelling whereas postglacial sedimentation was reconstructed by means of radiocarbon dating and palynological analyses. Subject to variable subsurface conditions (e.g., grain sizes, bulk densities, and water contents) multiple geophysical methods were applied to detect sediment thicknesses. 2D DC resistivity surveying was used most extensively as it delivered most detailed and realistic subsurface models with only low residual errors in the fine-grained and water-saturated central and distal part of the basin. With a lower data density,