THE EARTH SURFACE PLAYGROUND





The trembling of a disrupting Alpine peak

NEAR REAL TIME SEISMIC SENSING OF WEATHER-DRIVEN ROCK FAILURE INITIATION AT THE HOCHVOGEL

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Conceptual approach – What is being done to the rock mass



Progressive evolution of

Joint plane failures

Shear plane development

Crack opening, deepening

Filling of main crack

Subsidence of failing mass

Sculpting of isolated towers



Conceptual approach - How can we tackle these mechanisms (seismically)

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Conceptual approach – How can we tackle these mechanisms (seismically)

GFZ





 SCOPE
 THE APPROACH
 PEAK EVOLUTION
 PEAK EVENTS
 DOWNSLOPE
 ?!
 OO

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Intrumental approach







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Processing approach II – Explore discrete activity periods of the peak



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Processing approach II – Explore discrete activity periods of the peak



01.01.2013



Processing approach II – Explore discrete activity periods of the peak





Zeckra et al. (2016) **HELMHOLTZ** RESEARCH FOR GRAND CHALLENGES

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Processing approach II – Explore discrete activity periods of the peak





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Processing approach II – Explore discrete activity periods of the peak



Locations sliced by depth below surface





























Anthropogenic signals







Earthquake



Peak to slope – How does crack activity translate to mass movement activity?



Slope activity, avalanche-like

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Wrapping up

Monitoring and early warning tool

Seismic antenna with telemetry is able to i) continuously survey material state changes and ii) detect & locate discrete activity episodes. Do we see an early stage of Askja?

System parts not yet properly coupled

Joint surveying of peak and slope activity suggests yet independent behaviour. But we had an "unusually" dry summer 2018 (and are ready for the next months).

Combining the approaches

Combining precise measurements of reactions (crack meters, photogrammetry) with spatially resolved source detection (seismic antenna) will deliver the details needed to understand drivers, triggers and links to forcing mechanisms.







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Slides available at www.micha-dietze.de



