Sedimentology of the glacial facies within the **Deckenschotter of Northern Switzerland**

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observations

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rare

evidence

direct



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Motivation

- Presumed glacial deposits within the Höhere and Tiefere Deckenschotter Groups (HDS, TDS) – the oldest Quaternary deposits in Switzerland – are important markers of ice-contact during the Early Pleistocene but remain poorly studied.
- Glacial sediments may yield information on glacier geometry, flow and bed characteristics in the Deckenschotter paleo-landscape.

Evidence for a glacial origin in HDS & TDS:

- common indirect Glaciofluvial deposits
 - Erratic boulder (glacial lag deposits) (e.g. TDS: Iberig/Bruggerberg, Rhinsberg; HDS: this study, Dürn, Strengebrunnen)
 - Glacial deposits (this study)
 - (e.g. TDS: Iberig, Schienerberg, Stammerberg; HDS: this study, Hagenfirst, Hohrain)
 - Glacial basins & fills (e.g. TDS: Schienerberg, Stammerberg; HDS: Uetliberg?, Bürglen?)



First results for three Höhere Deckenschotter sites 1 Bürglen (Albis) **2** Uetliberg

3 Gravel pit Feusi



Section with fluvial (bottom) and glaciofluvial (top) gravel

deformation (silt & sands interbedded with stratified

diamicts from subaqueous debris flows)

Interbed of glaciolacustrine deposits with variable degree of

► Interbed of matrix-supported glacigenic diamicts (~10 m thick)





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- ► Matrix-supported glacigenic diamicts, up to ~40 m thick (?) resting on inclined bedrock surface
- ► Top erosionally cut, infilled with deltaic to lacustrine deposits
- Overlain by upward-coarsening glaciofluvial gravels (Uetliberg-Schotter, HDS)







- Glacigenic diamict, clast-rich, laterally thinning
- Diamict is massive at base and crudely stratified and convoluted with hanging gravel
- Diamict likely from an outrunning glacigenic debris-flow

Ongoing analysis

Geotechnical characterisation



Clast & provenance analysis

Striations, facetted shape, break-outs indicative for glacial transport prior to deposition



Thin-section analysis

Massive diamict facies





Stratified diamict facies







Fine-grained, **laminated** facies





Consistency limits



Clast with glacial striations Crosscutting glacial striations and pressure solution pits indicating clast rotation indicating Molasse origin during glacial transport











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The Höhere and Tiefere Deckenschotter Groups of Northern Switzerland are dominated by fluvial to fluvio-glacial sediments. In some outcrops, the gravelly facies is associated with diamictons interpreted as glacial tills (e.g. Heim 1891, Frei 1912, Graf 1993). Despite the importance of these presumed glacial deposits as markers of ice-contact during the Early Pleistocene, they remain relatively poorly studied. We present results from an ongoing project to better constrain the depositional environment of these diamicts at selected key sites using detailed macro- to microscale sedimentology, fabric and geotechnical analyses. Our analyses will help to better constrain the extent and characteristics of glacier advances related to the first extensive glaciations of the Alps.

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