Hydrogeology and Geology at the Trafelberg

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Besides other parameters such as air pressure and temperature, the hydrology of an area can have great influence on geophysical measurements. Hydrology becomes a more complex factor particularly in the region of the Conrad Observatory, which is situated in a carbonate region. Furthermore, the hydrogeology, which describes the interaction between water and rocks, and the geology become important parameters.

Figure 1: Folded Wetterstein limestone along a forest road.

The Trafelberg belongs to the northern limestone Alps, which are characterized by their karst phenomena. The majority of the mountain is located in Unterberg nappes (Triassic) and only part of the northern slope is situated in Reisalpen nappes (Triassic). Both Unterberg nappes and Reisalpen nappes belong to tirolikum.

The main lithological units in the area of Trafelberg are, from oldest to youngest, the Gutensteiner limestone (Anis), the Wetterstein limestone (Ladin – Cordevol), the Wetterstein dolomite (Ladin – Cordevol) and the Dolomia Principale Formation (Oberkarn – Obernor). Due to the large amount of folds in the underground, as seen in Figure 1, the structure of the mountain is fairly complex in parts. The layers of the units dip towards the south.

Springs are of great interest concerning hydrology, however there are no springs on the Trafelberg itself. The closest spring rises at the northern border of the mountain, near the cave Myralucke ("Myra Hole"). This spring is the origin of the brook Myrabach, which flows along the northern side of the Trafelberg to the east. Instead of springs many, mainly small water holes were observed on the mountain. These are nurtured by surface precipitable water draining off. Particularly at the time of snow melt or fierce precipitation are water discharges observed in the gutters.

A hollow, which is situated close to the Seismic Gravimetric Observatory (SGO) and has been filled with sediment over time, is of particular interest for geophysical observers. Due to the great body of sediment, it has the potential to staunch water. Such a large body of water so close to the SGO is of high importance to gravimetric measurements, which can be strongly influenced by local hydrological conditions. This is especially important if the subsurface water flow leads beneath the SGO because of the local joints and karst phenomena.

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