Heterogeneous subcontinental mantle lithosphere exposed on the ocean floor: The Totalp area, Davos

DATE: June 21 (pre-conference, 1-day)
EXCURSION FEE: €30 for lunch box and guide material
People without a 'Davos Inclusive' Transport Pass, normally provided by Davos hotels, will also have to buy a cable car ticket on the day for c. €20
NUMBER OF PARTICIPANTS: 5-20

LEADER: Arjan Dijkstra, University of Neuchâtel (arjan.dijkstra@unine.ch). Co-leaders will be confirmed at a later date.

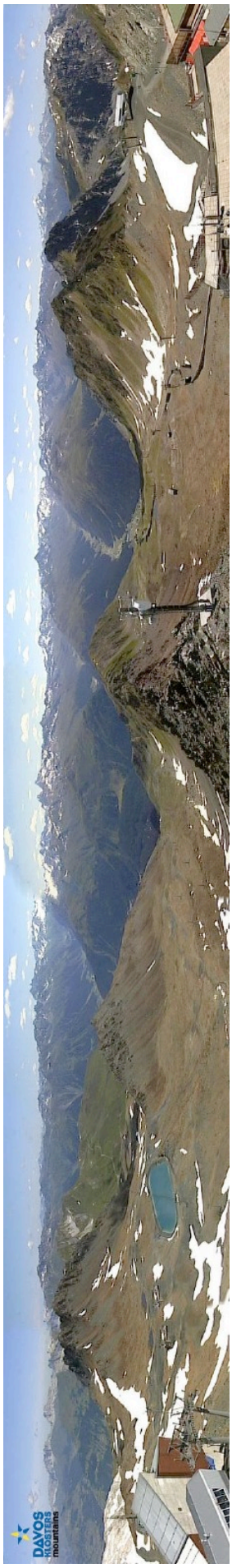
In the Totalp area, a remarkable fragment of a fossil Ocean Continent Transition (OCT, transition of the Adria Margin with the Piemonte-Liguria segment of the Tethyan Ocean) is well exposed. The Totalp unit consists of moderately to strongly serpentinized peridotites, overlain by ophicarbonate breccias, Jurassic radiolarites and Cretaceous pelagic limestones. The Totalp area is part of a tract of OCT rocks from the Adriatic Margin that also include the Platta and Malenco units further south (see also Malenco excursion). Uniquely, the Totalp unit has suffered only very limited, very low-grade regional Alpine metamorphism. The peridotites (typically spinel-lherzolites) are essentially samples of subcontinental mantle lithosphere, exhumed to the ocean floor. They contain numerous pyroxenites, including rare garnet-clinopyroxenites and garnet-bearing websterites. On this one-day excursion, we will visit some key outcrops in the peridotites and the overlying sediments, and we will discuss the heterogeneous nature of the mantle (and the meaning of recent Re-Os isotope data), its exhumation history, and its association with the overlying oceanic sediments.

The Totalp area can be reached in 25 minutes by funicular/cable car from Davos to the Weissfluhjoch station at 2686 m. The outcrops are all within 3 km from the cable car station and are connected by comfortable walking tracks. Return is again by cable car to Davos. For participants staying in hotels that provide a Davos Inclusive Transport Pass to their guests, the cable car ride is free. Note that the area is also suited for individual one- or half-day visits during the conference, and an excursion guide will also be available to non-participants.

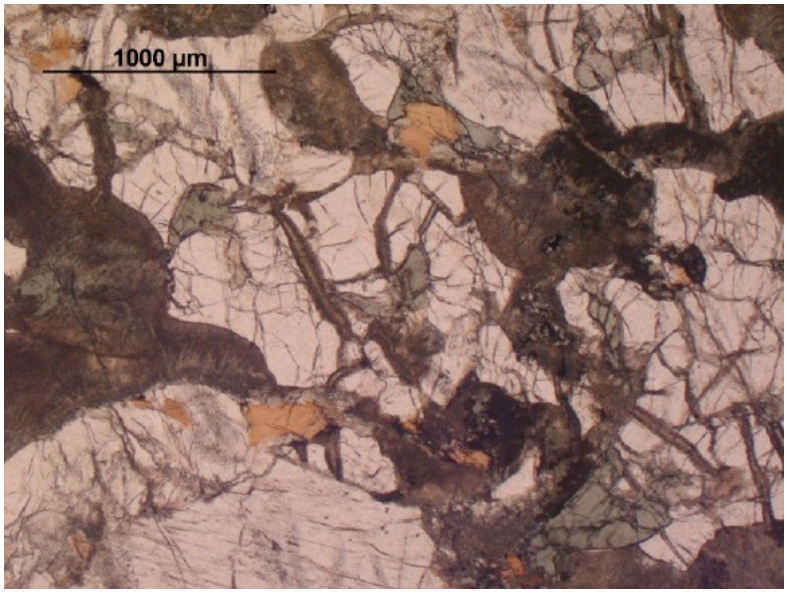
PROGRAM (provisional)
8h30 All assemble at the Parsennbahn funicular/cable car station in Davos-Dorf
We'll spend most of the day in the field and also have lunch in the field (lunch box will be provided). We will visit outcrops of peridotites and pyroxenites in the area north and south of Wasserscheidi and near Totalp See, of ophicarbonates and oceanic sediments around the Schwarzhorn. If time and weather permits, and only for those who want, we can make a panoramic tour via Parsennfurgga back to the Weissfluhjoch station (a 5 km hike), otherwise we simply return the way we came. Return in the late afternoon by cable car to Davos-Dorf (last cable car leaves Weissfluhjoch at 17h00).

SPECIAL REQUIREMENTS
Even though the walking is mostly on comfortable tracks with limited vertical relief (300 m, 500 m if we opt for the Parsennfurgga tour), the excursion takes place in alpine terrain at relatively high altitude (up to 2700 m). Good hiking shoes, cold and warm weather clothes, water-/windproof jacket, backpack, water bottle, and sunscreen are a requirement. The excursion may involve very limited off-track walking.

SWISSTOPO Map sheet 1197 (Davos) 1:25,000
WEBCAM http://www.davosklosters.ch/Service/Webcams/dD0zMyZkPTcmbD1kZXU.html









Photos: Totalp panorama; Peridotite-websterite layering; Garnet-green spinel-amphibole-kelyphite intergrowths in gt-sp-clinopyroxenite; Ribbon cherts and ophicarbonates.