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Meso- and micro-structural analysis of the Briançonnais Front in the Grand Saint Bernard area (Aosta Valley - Italy, and Valais - Switzerland)

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We present preliminary results on the meso- and micro-structural evolution of high-strain rocks of the Houillère Zone and Pierre-Avoi Unit outcropping along the Swiss-Italy boundary ridge, to the west of the Grand Saint Bernard Pass.

The stack of Middle and External Penninic units is folded by polyphasic folds, developed at least partly under low-grade metamorphic conditions. Different generations of folds show isoclinal to open geometries. Fold axes are subhorizontal, trending NE-SW, and the overall fold interference pattern can be generally classified as a type 3 (Ramsay). At the microscale, an important deformation mechanism is pressure solution cleavage, consistent with relatively low-temperature conditions.

Brittle-ductile shear zones, characterized by anastomosing bands of very fine-grained fault rocks, with pressure solution seams and SCC' shear bands, exploit the weak and strongly anisotropic phyllosilicate-rich layers, particularly in the black schists of the Houillère Zone.

Brittle high-angle faults crosscut ductile and semi-brittle features and show an oblique-normal kinematics. These faults are particularly well developed in the more competent rocks of the Pierre-Avoi Unit (e.g. massive carbonates, metaconglomerates and metasandstones).

A continuous horizon, a few metres thick, with a high density of quartz veins, can be followed in the internal and upper part of the Houillère Zone. This horizon is folded, at least by the younger open folds, and constitutes a major marker to study the large-scale structure of this unit.