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Mesoscopic Indicators of Shear Zones in Salt Rocks within the Kłodawa Salt Diapir, Central Poland

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Shear zones are one of the most important tectonic features in salt diapirs as they accommodate large part of stress operating in evaporite series during deformation. Although they are common, it is usually difficult to depict them mesoscopically due to the lack of strain markers in rock salt and due to their dominant layer parallel arrangement. Studies carried out within the Kłodawa salt diapir (built of Zechstein evaporites) enabled to distinguish several mesoscopic indicators of shear zones. These were: rotated desiccation fissures, rotated "cellular structures", and shear folds.

Desiccation polygons are rare but most precise shear indicators, which allow both interpreting the shear sense and assessing numerically the amount of shear strain. Desiccation fissures forming the polygons were originally perpendicular to layering, thus, after shearing in bedding-parallel shear zone, their inclination indicates shear direction. The angle of inclination to the layering equals $90° - \Psi$ (Ψ is angular shear strain). More detailed information is obtained when the lines of intersection of the fissures are analysed, using the stereographic projection.

"Cellular structures" is a term for structures of uncertain origin, having polygonal shapes in planar section and cross section. They form nets of hexagons (dominantly; their sides are more or less equal) in several continuous zones in rock salt. The shape of cells is marked by concentration of anhydrite. In shear zones, the polygons become flattened and the ratio of the longest to the shortest diagonal changes from about 1:1 to >20:1. As the original dimensions are not known, the rotated cellular structures provide only relative information on strain.

Shear folds are the least precise shear zone indicators: they document shearing but do not allow to interpret its sense or magnitude. They have the character of folds isoclinal in cross section with intense zigzag pattern in hinge zones (they were referred to as "salt seismograms"). Major shear zones are marked by increase in their frequency and decrease in fold width.

Structural Investigation of the Paleozoic of the Drahany Upland, Moravia

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The Drahany Upland represents the easternmost part of the Rhenohercynian Belt of the European Variscides. The Drahany Upland is build of a flysch sequence of Lower Carboniferous age, i.e. shale, greywackes and conglomerates, and a preflysch sequence of Devonian to Lower Carboniferous age, i.e. spilites, carbonates and shales. An isolated occurrence of Silurian shales was found near the village of Stínava in the central-part of Drahany Upland.

A complex re-evaluation of the compass field data (Dvořák 1965, Chadima 1998) was carried out. The stereoplots of the poles to the bedding planes were drawn, and the principal directions (p-circles and p-poles) calculated for number of different segments of the area using the SpheriStat 2.0. program. The Down-plunging method (Suppe 1985, Chapter 2) was used to construct a number of different cross-sections and to determine the large-scale structure of the area.

The nature of the large-scale folds in each of the individual segments of the Drahany Upland can be described as cylindrical. Fold axes generally trend NNE-SSW, plunge directions differ in various segment of the area.

In the southern segment of the Drahany Upland the cylindricity axis plunges slightly to the NNE causing the southern erosional limit of the Paleozoic basin.

Further north, the plunge of the cylindricity axis gradually changes for the SSW forming an axial depression of the Paleozoic strata. The axial depression in the vicinity of the village of Olšany is evident from the geological map.

In the northernmost reach of the Moravian Karst the cylindricity axis plunges to the north. The northern limit of the Moravian Karst can be interpreted as a shallowly north-dipping dislocation.

Another interesting segment is represented by the vicinity of the preflysch Repechy Belt. The cylindricity axis plunges to the south in the northern part of the Repechy Belt and to the NNE in its southern part. The preflysch sequence of the Repechy Belt is thus situated in the axial depression. This interpretation