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AMS fabric and structural record along a strain gradient in an extrusive salt diapir (Kuh-e-Namak, Dashti, Iran)

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The AMS record and the halite fabrics on meso- and micro-scale were studied in detail on a well exposed salt extrusive body in Iran. In the Kuh-e-Namak (Dashti) mountain salt diapir, the deformation structures in colored salt are displayed along longitudinal profiles across the dome and two glaciers that extend from the NE and SW edge of the dome. The profiles from the dome to the frontal parts of the glaciers reveal a continuous strain gradient associated with transposition of the domal salt fabrics by axial fold cleavage development during flow of rock salt over the ridges in the channel. The extruded salt belongs to the Hormuz sequence of Neo-Proterozoic to Early Cambrian age.

From central dome towards especially the northern namakier, structural record revealed zonation from; 1) gravitational collapse related recumbent isoclinal folds in the dome, 2) flat normal shears at the edge of the dome, 3) collapsed vertical layering into flat lying transpositional fabric at the toe of the dome, 4) penetrative fold cleavage transposition of earlier fabrics above the topographical ridge in the base of the flow, locally displaying strong transversal constrictional fabrics, 5) banded mylonites with isoclinal rootless folds in subhorizontally banded frontal and marginal domain of the glacier.

The AMS fabric in the rock salt is generated primarily by hematite dispersed in the recrystallized halite. The AMS exhibits three main types of fabric symmetry from clustered all directions (K1,K2,K3, orthogonal fabric) to clustered K1 directions with girdle forming K2,K3 axes and clustered K3 directions with girdle of K1 and K2 directions. The AMS fabric clearly reflects the macroscopic fabric transpositions along the entire investigated strain gradient in the rock salt. Magnetic fabrics reveal continuous trends from bimodal to semi-girdle distribution of foliations in folded and cleavage present regions, to magnetic lineation clustering perpendicular to flow in completely refolded domains and to flat lying orthogonal fabric in mylonites at the frontal and marginal edges of the glacier.