

## Variations in structural style on the Reykjanes Peninsula

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Differences in structural style consistent with seismic and GPS data indicate that the Reykjanes Peninsula does not behave as a uniform tectonic domain. We find that the distribution of fractures is systematically related to the geometry and location of the plate boundary axis and the zone of maximum volcanic production. While there is considerable overlap, the following general statements are valid. 1) fractures striking between  $000^{\circ}$  and  $020^{\circ}$  are restricted to the plate boundary axis zone 2) fractures striking between  $020^{\circ}$  and  $040^{\circ}$  tend to cluster around eruptive fissures and parallel their trend. 3) fractures striking between  $040^{\circ}$  and  $060^{\circ}$  tend to cluster at the ends of eruptive fissures and outboard of the zone of eruptive activity. 4) fractures striking between  $060^{\circ}$  and  $080^{\circ}$  are found almost exclusively at the margins of the rift zone and are more predominant north of the plate boundary. Complex interactions between strike-slip and dip-slip faults occur at the inside corner of bends at both ends of this oblique plate boundary segment. Two distinct sets of normal and/or oblique-slip faults interact along the rift margin. Within the axial zone strike-slip faults commonly intersect eruptive fissures and exhibit a spacing similar to that for strike-slip faults in the South Iceland seismic zone. Our data indicate that there has been both spatial and temporal variability in the stress field due to the combined influence of three factors: 1) the geometry of the plate boundary with respect to the spreading direction; 2) spatially variable magma pressures in the zone of active volcanism, and 3) local stress perturbations caused by slipping faults and eruption of magma.