

FRACTURE NETWORK EVALUATION OF SAMANA ANTICLINE: A FAULT-RELATED FOLD AT THE FRONT OF TIRAH RANGES, ORAKZAI AGENCY, NWFP, PAKISTAN

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Samana Anticline is a well developed fault-related fold exposed along the front of Tirah ranges with its southern limb thrust over the Paleocene-Eocene rocks of the Kohat Plateau. It is cored by carbonate and sandstone rock assemblage of Jurassic to Paleocene age with well developed fracture network including three basic forms that are extension, shear and pressure solution seams of meso-macroscopic scale.

Extension fractures, predominantly oriented at high angle to the bedding surfaces can be distinguished into two orthogonal sets that are parallel and transverse to the fold axis. The shear fractures observed along the Samana Anticline define a conjugate set trending northeast and northwest. Almost all the bedding surfaces within Jurassic-Paleocene rocks are characterized by well developed stylolites.

Fractures density calculations reveal that it is greatest at fold culmination followed by forelimb and back limb which implies that fracture porosity and connectivity is greatest at the hinge area of Samana Anticline. The entire fracture network bears close spatial coordination with Samana Anticline suggesting that their genesis is synfolding and the Samana Anticline has itself evolved as a flexural slip fold. The Samana Anticline can serve as a case example for the type of fracture system that should have been developed in similar anticlinal closures underneath Kohat Plateau.