

Structural Evolution and Deformation Style Deciphered Through Integrated Seismic Structural Model of Shakardarra, Kohat, Pakistan

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Abstract

Geologically, Shakardarra is a suite of complex deformational structures related to different origins in their evolution. An integrated seismic structural model based on seismic line 865-NK-15, well data of Chanda-1 and surface orientation data is prepared. Time and depth values for Samanasuk limestone are calculated and extrapolated to the cross sections. In the northern part of Shakardarra, disharmonic folds cored by Eocene evaporites are later transected by high angle thrust faults along their limbs. In the central and southern part, oppositely facing reverse slip faults present in the Siwaliks are linked and forming a pop up structure in the subsurface. These reverse slip faults are associated to strike slip fault in the south east of Shakardarra. The research suggests that the area is evolved sequentially in three episodes of deformation: i) detachment folding over the Eocene evaporites ii) thrust faulting in the northern part and iii) transpressional related reverse slip faulting in the central and southern part of Shakardarra.