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Investigation of active blind fault by aeromagnetic data in North of Birjand, east of Iran

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In east of Iran due to doesn't enough seismic data, we use of geophysical data for investigation of hidden active fault. In March 9th, 2008 an earthquake with ML=5.1 occurred in Aryan-Shahr area, 55 km north of Birjand, East of Iran. More than 100 aftershocks were recorded within 8 days after the main shock. At first, the Sedeh fault with N76 trend was informed as source of this earthquake. But the distribution of aftershocks has been occurred in an ellipsoid district, that the long axe of this ellipsoid is not parallel with Sedeh Fault. The long axis of distribution ellipsoid of aftershocks (N120) is nearly perpendicular to the Sedeh fault trend.
Investigation of aftershock epicenter dispersal and the interpretation of aeromagnetic data make known the existence a blind fault parallel to long axis of distribution ellipsoid of aftershocks, which has been named Gheysar blind fault. The Gheysar blind fault with $\sim$39 km length and trends of N126, appears to has a thrust component, and gently dipping ($\sim$20°SW).
magnetic data on this paper were compiled from information recorded along the flight lines, which were flown at 7.5 km. spacing in a direction perpendicular to the primary geologic trend within each block. Tie lines were flown with a 40 km spacing perpendicular to the traverse lines. The regional gradient of the earth's field has been removed. Magnetic counters show total intensity field in gamma. Regional gradient has been removed as explained elsewhere. If the fault plane terminates before it reaches the earth's surface, it is referred to as a blind thrust fault. Because of the lack of surface evidence, blind thrust faults are difficult to detect until they rupture. The March 9th, 2008 earthquake in Aryan-Shahr was caused by a previously-undiscovered blind thrust fault. In this study, Use of Aeromagnetic Data one technique is for recognition Blind fault.
By Reduction to the pole, Upward and Downward continuation, Horizontal, First and Second vertical derivative filtering in Geosoft software recognize blind fault in Aryan-Shahr area. So, we identify four blind faults in study area, and named Gheysar, Room-Chelunak, Shushood and Gazar blind faults.
Focal mechanism solutions of the area's earthquakes have been displayed to reveal mechanisms of seismically active fault zones. These solutions indicate dominance of thrust faults in a compressive regime fore vast majority of earthquake of Aryan-Shahr.
Active fault in Aryan-Shahr area are blind and the focal mechanism solution of the earthquakes of the region points to the presence of thrust faulting in its basement.
The aftershock zone is sub vertical beneath the Gheysar blind fault trace, broadening with depth.
so we fond a blind active fault beneath a quaternary anticline by aeromagnetic interpretation in Shahabad area.
Key words: Aryan-Shahr, Aeromagnetic data, Gheysar blind fault, Sedeh Fault