A REPORT ON FAULT AND FRACTURE ANALYSIS USING NEURAL NETWORK ASSISTED GEOMETRICAL ATTRIBUTES

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SUMMARY

Faults and fractures are the important components of structural information. The faults and fractures play an important role in creating areas of high porosity and permeability in reservoir rocks. Mapping these faults/fractures can give valuable information about fluid flow inside the reservoir. Seismic attributes often provide a quick way to visualize the trends of faults and fractures, which are not visible in seismic amplitude information. These set of information from different seismic attributes can be used to form fault geometry, and further it can be used to optimize well locations.

Neural networks are one of the most efficient ways in seismic object detection to recombine multiple input attributes into a single object-sensitive attribute. It is a good tool to enhance a geological interpretation of seismic data. Including specific spatial knowledge about the targeted object ANN allows us to separate objects of different geologic origin with similar attribute characteristics.

The main aim of this project was to generate optimum workflows for delineation of faults and fractures in the study area though multi attribute analysis. For this purpose first data conditioning was done to remove the noise and enhance the continuity of events. Faults and continuity were enhanced properly after applying DSMF and FEF on the given data. DSMF was used for further studies.

Secondly, different geometric and physical attributes were applied in detection of faults. Faults and fractures in the central part associated with the main fault were delineated properly after geometrical attribute analysis such as Polar Dip, Most Positive Curvature and Similarity.These attributes have clearly indicated the geometry of the fault and fracture.

Then ANN studies were done based on combination of individual seismic attributes using neural network system to create new attributes, which give the optimal view of the fault zones. With the help of the new produced fault probability attribute surrounding noises were suppressed and highlighting the faults. Application of supervised neural networks shows more convincible results than to individual attributes.

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