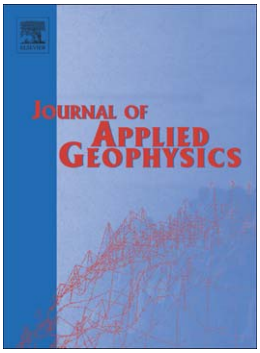

A combined approach based on MAF analysis and AHP method to fault detection mapping: A case study from a gas field, southwest of Iran

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A combined approach based on MAF analysis and AHP method to fault detection mapping: a case study from a gas field, southwest of Iran

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Abstract

A combined geostatitical methodology based on Min/Max Auto-correlation Factor (MAF) analysis and Analytical Hierarchy Process (AHP) is presented to generate a suitable Fault Detection Map (FDM) through seismic attributes. Five seismic attributes derived from a 2D time slice obtained from data related to a gas field located in southwest of Iran are used including instantaneous amplitude, similarity, energy, frequency, and Fault Enhancement Filter (FEF). The MAF analysis is implemented to reduce dimension of input variables, and then AHP method is applied on three obtained de-correlated MAF factors as evidential layer. Three Decision Makers (DMs) are used to construct PCMs for determining weights of selected evidential layer. Finally, weights obtained by AHP were multiplied in normalized valued of each alternative (MAF layers) and the concluded weighted layers were integrated in order to prepare final FDM. Results proved that applying algorithm proposed in this study generate a map more acceptable than the each individual attribute and sharpen the non-surface discontinuities as well as enhancing continuity of detected faults.