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## Polygonal Faults/Fractures Pattern within Abu Dhabi Onshore Lower Cretaceous Platform Carbonates

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Recent improvements in seismic interpretation tools highlight a polygonal sub-seismic pattern in the whole geological section, Abu Dhabi onshore fields. Does this new image result from real geological event or/and seismic noise?

Persistence of this geometry, through different seismic acquisitions, processing methods and interpretation tools suggests a geological origin.

Analyses of specific seismic attributes suggest the following conclusions:

- The pattern is characterized by "honeycomb shape" geometries as compared with polygonal fault patterns observed within clastic sediments or chalk. Each body (3D polygonal cell) is made of facets at different scale. Such a pattern has never been observed before in platform carbonates.

- Their vertical distribution is linked to mechanical strata units. It is lithological and burial dependant, although the relationship is not yet defined.

- Horizontally, a relation between the expression of polygons and the topography of the studied sequence is observed. The polygonal pattern is enhanced in deformed areas; facets are less expressed within quiet areas. Focused analysis within main fault zones reveals that fault segments are made of previously identified polygonal facets.

Geological and seismic observation supports an early origin of the polygons. Later during the late Cretaceous deformation event, some polygons facets evolved from a random orientation away from the faults to a slight readjustment, eventually to the fault plane itself. Fault segments are likely to re-activate former polygonal facets; these facets being re-organized as straighter fault planes.

Locally, dynamic data support the polygonal faults/fractures pattern as being flow barriers and /or vertical conduits for flow.

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