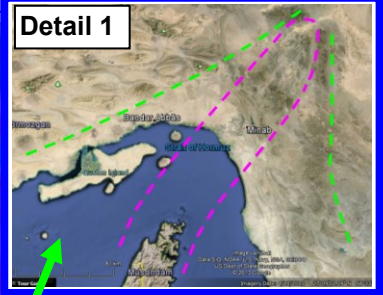
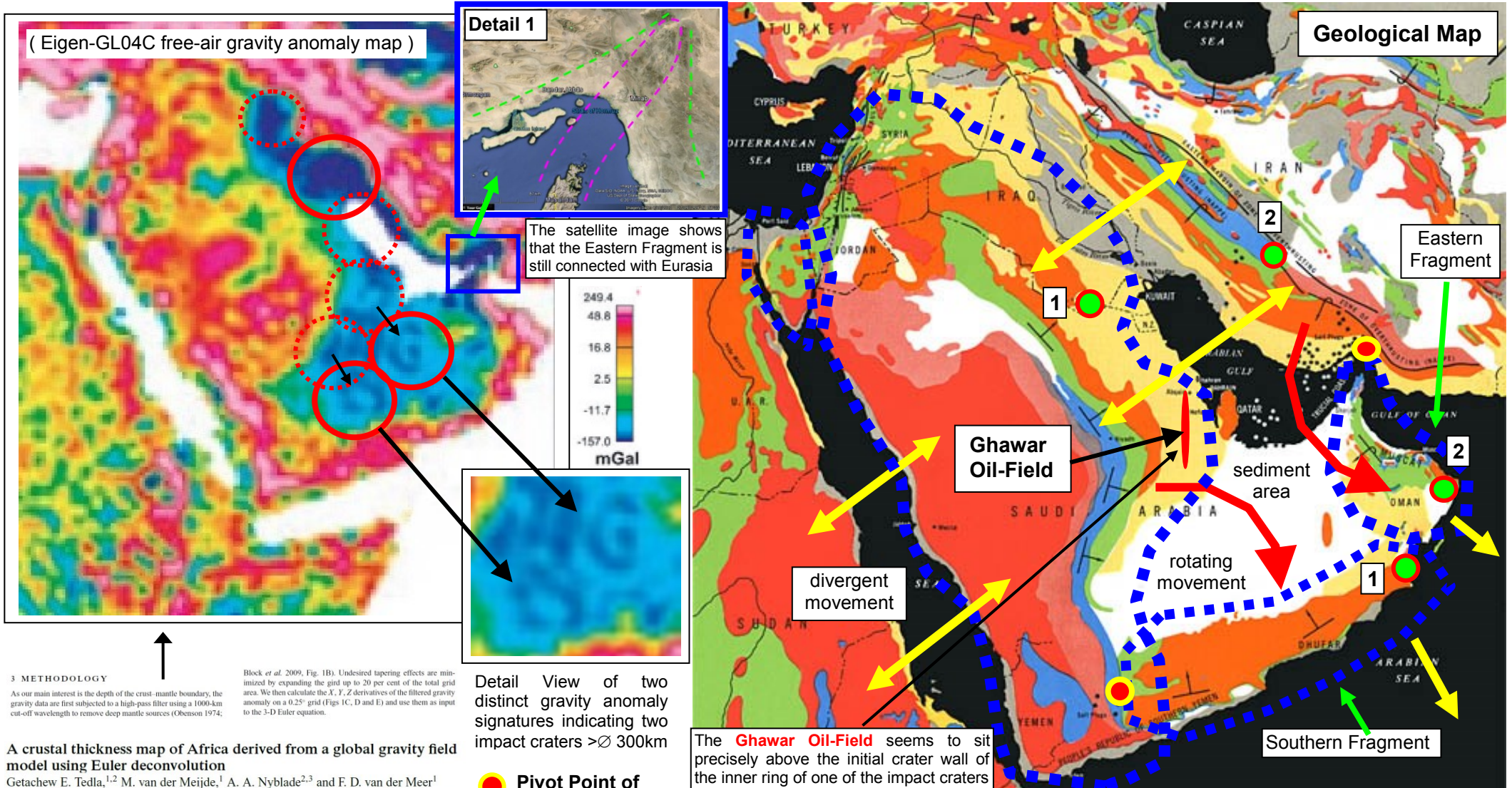
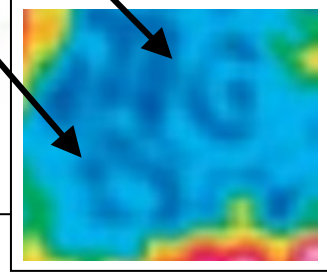
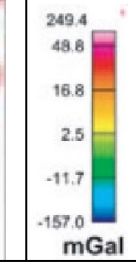


Arabia was formed by several impact craters (Ø 300-400 km), probably caused by ejecta from the PT-Impact Crater

The **gravity anomaly** map of **Arabia** indicates at least three circular structures, probably secondary craters from the PT-Impact 253 Ma ago, which caused extensive fractures and led to expansion tectonics in the area of Arabia. The impact impulse resulting from this impact event caused a divergent movement of three crust fragments, which eventually formed the arabian peninsula and with it the rich Oil- and Gas-Fields in the area of **Saudi Arabia**.



The satellite image shows that the Eastern Fragment is still connected with Eurasia



Detail View of two distinct gravity anomaly signatures indicating two impact craters >Ø 300km

- **Pivot Point of crust fragment**
- **Original connection point of crust fragment**

3 METHODOLOGY
 As our main interest is the depth of the crust-mantle boundary, the gravity data are first subjected to a high-pass filter using a 1000-km cut-off wavelength to remove deep mantle sources (Obenson 1974; Block *et al.* 2009, Fig. 1B). Undesired tapering effects are minimized by expanding the grid up to 20 per cent of the total grid area. We then calculate the X, Y, Z derivatives of the filtered gravity anomaly on a 0.25° grid (Figs 1C, D and E) and use them as input to the 3-D Euler equation.
A crustal thickness map of Africa derived from a global gravity field model using Euler deconvolution
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³School of Geosciences, The University of the Witwatersrand, Johannesburg, South Africa

The **Ghawar Oil-Field** seems to sit precisely above the initial crater wall of the inner ring of one of the impact craters

The arabian plate is a composition of at least three crustal fragments (blue marked areas) which moved to their present positions through the magmatic (lithospheric) streams which were caused by the impulse of the impact event. During the divergent movement, the area between the fragments first filled up with magma & water, and then later with sediments.

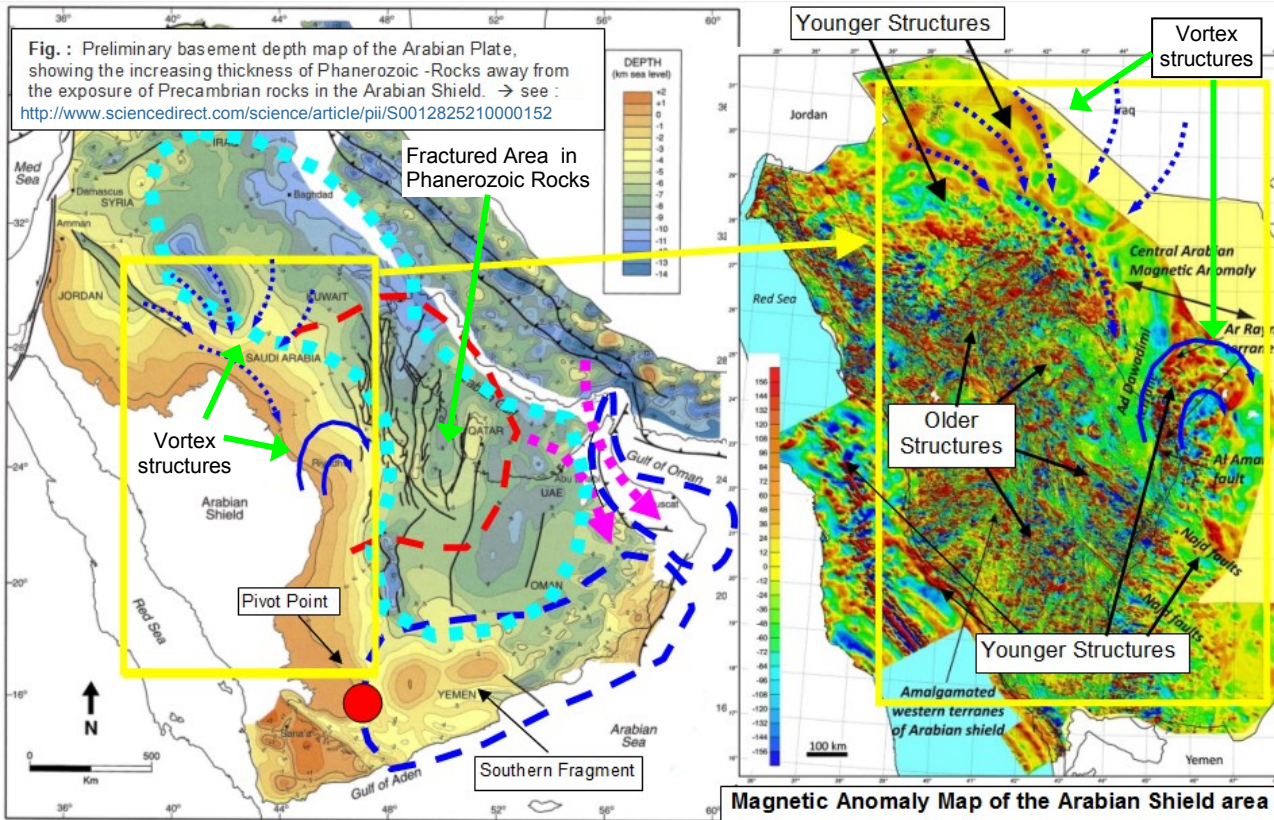
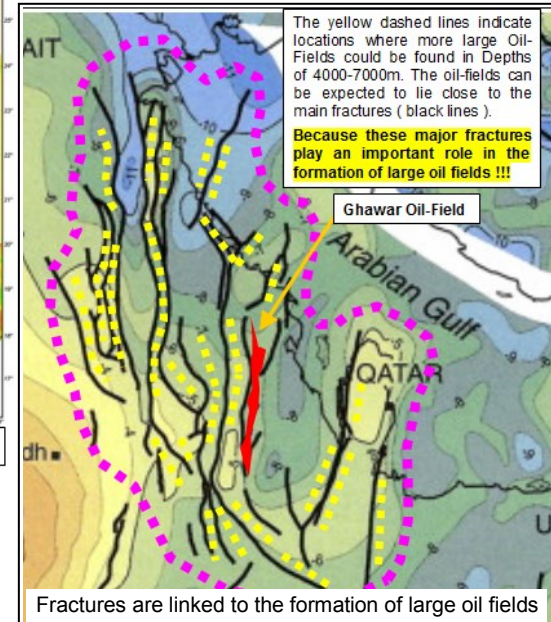


Fig. : Preliminary basement depth map of the Arabian Plate, showing the increasing thickness of Phanerozoic -Rocks away from the exposure of Precambrian rocks in the Arabian Shield. → see : <http://www.sciencedirect.com/science/article/pii/S0012825210000152>

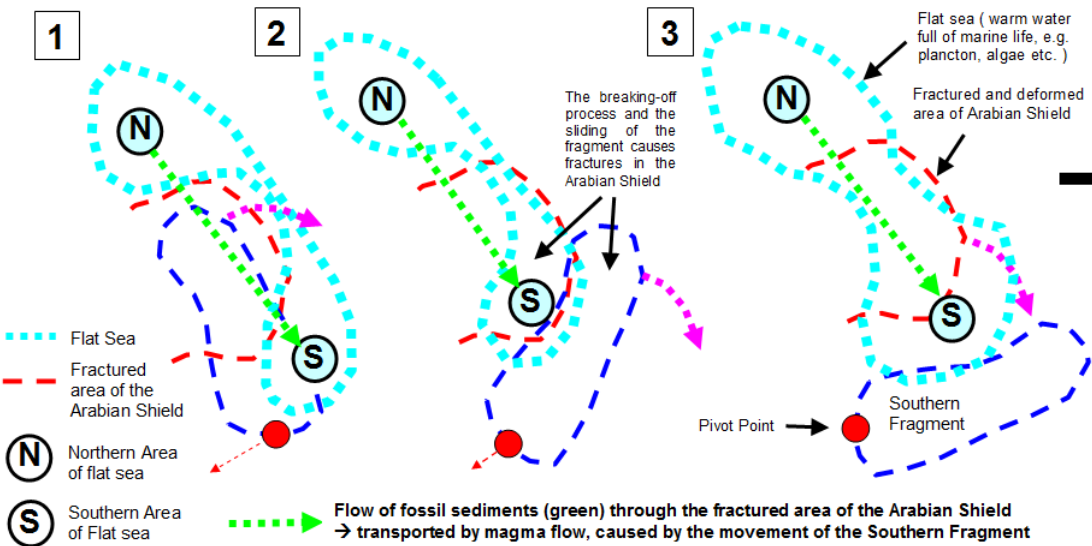
To the movement of the crust fragments which formed Arabia

On the Magnetic Anomaly Map of the Arabian Shield there are different shaped structures noticeable. Here the fine structures represent older geological structures of the Arabian Shield, and the “younger – rough structures” probably indicate the final movement of younger magma streams before they solidified (probably < 150 Ma years ago). There are stream-like structures visible. Even “vortex-like structures” are noticeable (full blue arrows) ! The marked young stream-like structures (blue dashed arrows) indicate that there was a general movement towards



a SE-direction of the magma streams. An analysis of a detailed magnetic anomaly map east & north of yellow marked area should confirm this this ! On the east side of the Arabian Shield there are extensive cracks visible, which probably were caused by the divergent movement of the crust fragments. The large **Ghawar Oil-Field** is orientated parallel to this cracks and formed in the initial center of a crater

Chronology of the movement of the Southern Fragment and the development of the Inland Sea → and their effect on the fractured and deformed area on the Arabian Shield



Stage 1 : The situation some time after the PT-Impact has caused compression & secondary impacts between Eurasia and Africa. In this stage Africa and the Arabian Shield were already moving away from Eurasia. In Stage 1 the Southern Fragment (blue) starts to rotate around the pivot point (red), caused by the impact impulse & magma streams acting on the Southern Fragment. An Inland sea starts to form

Stage 2 : shows the stage of maximum rotary velocity of the Southern Fragment → This is also the time of the maximum flow of magma and max. production of fossil sediments which accumulated in cracks of the fractured area of the Arabian Shield. Bio-mass was mainly produced close to the initial crater centers → This process created the big oil fields

Stage 3 : End state → Southern Fragment in final position → Magma streams stop → Inland Sea, maximum extent → Sedimentation starts