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Magnetic and gravimetric 2.5D modelling of the Central Atlas Range

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Through the use of GMSYS software (from Oasis Montaj®, Geosoft), the magnetic and gravimetric anomalies of several profiles representative of the different tectonic styles have been modeled to to contribute to unravel the Mesozoic and Cenozoic geometry of the Central High Atlas. Magnetic anomalies are determined through different gradients in the Total Magnetic Field Intensity (ICMT). Regional magnetic field was computed from anomalies from ICMT. Gravimetric anomaly profiles were obtained by extraction of map of anomalies of Bouguer from Bureau Gravimetrique International with a grid window of 3500 m..

Significant extensional tectonics during the Mesozoic development of sedimentary basins, as well as magmatic activity and deformations associated with salt tectonic determined resultant alpine structure, which together with the widespread compression during the Cenozoic led to the uplifting of the Central Atlas Range. Such structuring, constrained by field data and paleomagnetic orientations (as well as anisotropy of magnetic susceptibility analysis), conditioned geometries and configuration of bodies in 2.5D modelling. Petrophysic contrasts between Paleozoic, Trassic, Lias and Dogger have been characterized thought exhaustive sampling in 2018 and 2019 fieldwork campaigns; Cenozoic rock characterisation was interpreted form the literature. Significant contrast between units led to fit grav/mag anomalies computed in the cross sections modelled. Most lithologies presented magnetic susceptibility values ∼500*10-6 S.I., with contribution of para- and especially ferro-magnetic phases, although Triassic gabbro and basalts presented higher magnetic susceptibility (∼3000*10-6 S.I). This contrast is featured in analogue modelling. Tested intensity, declination and inclination of the magnetic remanence have been considered for magnetic modelling and density for gravimetric modelling.