



3D modelling of an aero-gravity and -magnetic survey as an first exploration step in a frontier basin

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The West African Taoudeni basin covers a desert area of about 1.8 million km² and is one of the last frontier basins worldwide. Here Wintershall Holding AG holds acreage of about 68000 km². During 2005-2007 geological surveys and an aero-gravity and -magnetic survey were conducted in this area. The potential field modelling should contribute first insight about the subsurface to plan an economic seismic survey. 2D models lead to poor results. 2008 the results of an internship (NK) were 3D subsurface models, which were enhanced during the following diploma thesis (Köther, 2009). Complex igneous rocks and sparsely distributed constraints lead to an ambiguous interpretation. Therefore, several simple 3D models were compiled with the in-house software IGMAS+, which base on geological ideas of the underground and fit well the measured data. These basic models allow a geophysical evaluation of different geological theories about the subsurface. Also, for a thorough interpretation field transformations (Euler, Curvature, and Derivatives) were calculated. These results led to new constraints for further interpretation of the basin structures and therefore they are important contributions for future exploration e.g. the planning of seismic surveys.