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IGMAS+ a new 3D Gravity, FTG and Magnetic Modeling Software

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Modern geophysical interpretation requires an interdisciplinary approach, particularly when considering the available amount of 'state of the art' information contained in comprehensive data bases. A combination of different geophysical surveys employing seismics, gravity and geoelectrics, together with geological and petrological studies, can provide new insights into the structures and tectonic evolution of the lithosphere and natural deposits. Interdisciplinary interpretation is essential for any numerical modelling of these structures and the processes acting on them

Three-dimensional (3D) interactive modeling with the IGMAS+ software provides means for integrated processing and interpretation of geoid, gravity and magnetic fields and their gradients (full tensor), yielding improved geological interpretation. IGMAS+ is an acronym standing for "Interactive Geophysical Modelling Application System". It bases on the existing software IGMAS (http://www.gravity.uni-kiel.de/igmas), a tool developed during the past twenty years for potential field modelling. The new IGMAS+, however, will comprise the advantages of the "old" IGMAS (e.g. flexible geometry concept and a fast and stable algorithm) with automated interpretation tools and a modern graphical GUI based on leading edge insights from psychological computer graphics research and thus provide optimal man machine communication.

IGMAS+ fully three-dimensional models are constructed using triangulated polyhedra and/or triangulated grids, to which constant density and/or induced and remanent susceptibility are assigned. Interactive modifications of model parameters (geometry, density, susceptibility, magnetization), access to the numerical modeling process, and direct visualization of both calculated and measured fields of gravity and magnetics, enable the interpreter to design the model as realistically as possible.

IGMAS+ allows easy integration of constraining data into interactive modeling processes, visualization and combination of geodata with density/susceptibility models. These visual overlays of different 2D and 3D datasets enables quantitative comparison and adjustment and results in models that are constrained by as much independently derived information as possible.

The use of the programming language Java/Java3D will ensure that IGMAS+ will be a flexible, platform-independent tool, which, at the same time, can incorporate the interfaces needed for the integration of plugins and user-defined functions.