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Concept of information models in GGOS

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GGOS divides geodesy as a discipline into three parts, so called “pillars”. First pillar consists of methods, techniques and theories that are used to determine Earth’s shape (its surface: solid Earth, ice and oceans) as a global function of space and time (kinematics). Second pillar regards to Earth’s gravitational field determination and monitoring, it also describes mass distributions and the shape of the geoid. Third pillar concerns planet rotation and forces related to interactions between Earth and other celestial bodies, especially the Moon and the Sun. These three pillars constitute province of modern geodesy.

Different parts of the overall system are cross-linked through observations and inter-dependent. All these techniques are affected by and measure the "output" of the same unique Earth system, that is, the various geodetic fingerprints induced by mass redistribution and changes in the system’s dynamics.
Consistency of data processing, modeling, and conventions across the techniques and across the "three pillars" is mandatory for maximum exploitation of the full potential of the system.

The main purpose of this paper is to make an introduction to full description of connections between all GGOS components and describe GGOS information structure - a great number of mutually related objects, phenomena, theories. Understanding of relations and dependences within GGOS is necessary to conscious usage of it products. The authors’ intention is to show and explain examples of such relations related to the part of GGOS, which is described as “Geokinematics”, “Gravity field”, “Earth rotation”, “Reference systems”. The next step is to present those dependences using Unified Modeling Language (UML) – formal language, which is used to model and describe reality in object-oriented analysis and programming.There are packages "Geokinematics”, “Gravity field”, “Earth rotation”, “Reference systems” and classes for each package defined. To show connections between some GGOS components there are UML relationships shown.

Recognition, description and development of GGOS information structure is of crucial importance for proper processing and interpretation of data, as well as for planning new experiments and missions. Using IT means, such as UML, provides computerized and integrated analyses of data and coordinated management and cooperation.