J Aeronaut Aerospace Eng 2015, 3:3
http://dx.doi.org/10.4172/2168-9792.S1.008

OMICS International
conferenceseries.com

International Conference and Exhibition on
Satellite

August 17-19, 2015 Houston, USA

Satellite data in fundamental physics and global dynamics study

V I Ferronsky
Water Problems Institute of the Russian Academy of Sciences, Russia

The effects of the earth oblateness and the related problems of irregularity in the rotation and the planet's pole motion and also the continuous changes in the gravity and electromagnetic field have a direct relation to the solution of a wide range of scientific and practical problems in the Earth dynamics, geophysics, geology, geodesy, oceanography, hydrology and climatology. The satellite data play decisive role in understanding physics of the problem. It was found by interpretation of the observed geodetic satellite orbit data that the earth and the moon movement are not in hydrostatic equilibrium. This is a fundamental conclusion important for study dynamics of celestial bodies. The satellite orbits data for solving the nature of the earth oblateness problem are interpreted on the basis of the known in celestial mechanics theory of expansion of the gravity potential of a body by spherical functions. It was found by interpretation that the earth is a tri-axial body. The differences between the major and minor equatorial semi-axis, a and b was found to be as a=6378160 m, b=6377504 м, and a – b=656 м. The next step in that direction is discovery of kinetic energy loss of the Earth and other celestial bodies. The ratio of the kinetic energy to the potential one is ~ 1/300, that is the same as its oblateness. Such a ratio does not satisfy the fundamental condition of the virial theorem. In fact, the other planets, namely, Mars, Jupiter, Saturn, Uranus, and Neptune, exhibit the same behavior. But for Mercury, Venus, the Moon and the Sun, the potential energy exceeds their kinetic energy by 104 times. Since the bodies in reality exist in equilibrium, the answer was found that the kinetic energy of the body's interacted elementary particles is not taking into account. In this connection the generalized virial theorem was solved and the energy as an effect of the particles interaction instead of the vectorial force was introduced. On that basis hydrostatic equilibrium of an orbiting body by dynamical equilibrium was changed.

ferron@aqua.laser.ru

ATVCAP- Knowledge capture in ESA projects

Roberta Mugellesi Dow
European Space Operations Centre, Germany

Knowledge Management (KM) has been around in ESA since several years leading to initiatives and pilot projects in different areas. To be successful, KM must clearly meet the Agency real needs. It must suit the way of working and must be linked to the core business that is the assembly and execution of space missions. In particular, it needs to address the issues of how projects are managed. The opportunity to apply the KM tools and methodologies already developed to an ESA project arose late 2013 when KM was requested to support the capture and preservation of the knowledge, experience and documentation built over the several missions of the Automatic Transfer Vehicle (ATV). This presentation describes the work which is being conducted for the ATV knowledge capture project called ATVCAP. In particular, it specifies the objectives and the steps required in order to achieve it. At the very end, a dedicated user interface (portal, search) has been developed for an efficient retrieval of the information by the future users of the preserved knowledge. The project started in January 2014 and the first knowledge area handled was Rendezvous and Docking, which was used as the base for the Proof of Concept, demonstrated by end of March 2014. Of course, the conduct of the ATV capture project requires the involvement of the relevant teams of the ATV project and the members of the KM group. Some general remarks concerning the archiving of documentation and the retention of knowledge highlighting the critical areas are outlined.

Roberta.mugellesi.dow@esa.int