

4 IERS Workshop on Global Geophysical Fluids

This workshop was organised to take an insightful review of where the Global Geophysical Fluids Centres (GGFC) are and to discuss options for potential changes to the structure of the GGFC such that today's users can easily find the models and data sets that they need. It took place at the Hotel Grand Hyatt, San Francisco, USA, on December 06 – 07, 2006.

The main goal of the workshop was to determine whether the GGFC was adequately addressing the needs of the community. The original concept of a Global Geophysical Fluids Centre within the IERS, consisting of Special Bureaus defined by the fluids themselves, was an excellent first step to serving the needs of the geodetic community. Ten years on, the community and their needs have changed as the precision of the geodetic observations has been significantly increased. The division of the GGFC along the lines of the fluids generating a geodetic effect may no longer be sufficient. Therefore the time is right to consider a restructuring of the GGFC.

More than 25 participants followed the invitation for two days. Invited speakers addressed the community needs and what other communities could contribute to the GGFC.

F. Flechtner titled his paper "What can GGFC get from Gravity missions?" He demonstrated that short-term mass variations on sub-daily to annual time scales caused by mass redistributions in the Earth's subsystems, i.e. the atmosphere, the oceans, the lithosphere, the hydrosphere and the cryosphere are aliased into the monthly GRACE gravity field solutions if not corrected properly. To eliminate short-period non-tidal atmospheric and oceanic mass anomalies from monthly mean GRACE gravity estimates the AOD1B product was developed at GFZ which is based on 6-hourly ECMWF Operational Analysis meteorological data and an ocean model forced with ECMWF data, too. Hydrological mass variations are not yet taken into account. Therefore the prime outputs from GRACE are monthly maps of the continental hydrological cycle. Nevertheless projects started to assimilate GRACE and to provide hydrological mass variations on daily basis (e.g. TIVAGAM). If assimilated by the GGFC time series could be made available of 6-hourly and monthly-mean (corresponding to the GRACE gravity field solutions) atmospheric, oceanic and combined as well as ocean bottom pressure mass variations (AOD1B RL04) based on ECMWF forcing, mean field 2001+2002, mass-conserving OMCT, vertical integrated pressure, surface pressure (for OBP), harmonized land/water mask and L1/L2 standards.

M. Watkins with his presentation "What can GGFC do for Global Gravity Missions?" followed these ideas but also stated that most

of the analysts are interested in running alternate de-aliasing models provided e.g. by the GGFC. Therefore he recommended that the IERS should strongly consider becoming an integral part of the analysis system of upcoming missions through a demonstration focused on re-analysis and possibly growing to a more operational role (as for Earth orientation).

The Earth rotation community needs were formulated by R. Gross. To model the angular momenta precise information is necessary about the motion and the mass redistribution of all geophysical fluids, e.g. atmosphere, oceans, hydrosphere, mantle, core on global and regional scales and subdaily to decadal time scales. For the various torques (tidal, gravitational, friction, mountain, viscous, electromagnetic) adequate external, surficial and internal data from earth are required.

After the definition of needs all chairs of the special bureaus except the hydrology and core SB's demonstrated their products and capabilities.

During the discussion various defects were found within some GGFC special bureaus and data sets. Data should be improved in the areas of reliability, the state of the art, improved documentation, common formats and units, precision information. After additional data sets, e.g. mapping functions and GRACE products were requested, the ILRS offered to provide ongoing data for geo-centre variations and the University of Vienna is able to contribute its mapping function on a regular basis.

More detailed information on the workshop and all presentations can be found at

<http://www.iers.org/MainDisp.csl?pid=66-1100113>.

At its subsequent, 43rd meeting, the IERS Directing Board agreed that the GGFC chair will draft a plan for improving the GGFC data and in particular the SBL products to get more acceptance by the community.

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