3.7 IERS Working Groups
3.7.1 Working Group on Site Survey and Co-location

The Charter, Goals and Objectives and the list of members of the IERS Working Group on co-location and local ties – Jointly with IAG Sub-Commission 1.2 – can be found at the IERS WG web site: <http://www.iers.org/WGSiteSurvey>

WG Meeting

A meeting of the WG took place in Vienna, during the EGU 2010 meeting, May 4th, 2010, 19.00 h-20.00 h at the Vienna International Centre venue, Meeting Room SM3, with the following agenda:

1. Site survey standards:

2. Tie vector estimation:
   1. Software – Identify groups capable to exchange tie vector estimation software and data sets for cross-checking and testing. Define a road map toward tie vector estimation software diffusion.
   2. Software output – Tie vector components in the native topocentric frame (prior to alignment) must be saved as part of the routine output.
   3. Tie vector alignment – The approach adopted to align the tie vector into the global frame (topocentric to global transformation) has to be specified in the output. Optimal procedures must be investigated further.

3. Site Surveys activities:

4. Coordination and research:
   1. PCV & technique-dependent biases – VLBI technique: identify surveying groups capable of investigating gravitational deformation of VLBI telescopes and producing AGD files for investigation of VLBI height and scale biases. Other techniques: status on PCV and related biases in SLR and DORIS.
   2. Alignment – See previous 2.3.

5. Miscellaneous

Participants:

Invitees:
D. Angermann, T. Kluegel, C. Ma, M. Pouttanen, S. Boeckmann,
The interest on the topics covered by the WG chart is high in the geodetic community, as shown by the remarkable number of invitees that participated to the WG meeting. The discussion partially focussed on the possibility to write guidelines for surveyors to be resumed in a reference manual for practical on field operations. Although time consuming, a drafting of such document is feasible and would be useful under certain circumstances. Nevertheless, as chair of the working group, I have to stress the complete lack of agreement on the methods to be adopted for tie vector surveying among the groups involved in local tie surveying. This certainly jeopardizes the efforts spent on the preparation of a reference manual and it compromises its significance and validity.

As the local ties are performed mostly by local on-site surveyors, the methods are highly site dependent and may differ considerably one another. Nevertheless, a harmonization of the different surveying method is needed to dominate and control several factors that impact on the accuracy of the tie vector. In addition, the different homemade software which are used specifically to reduce and condition indirect terrestrial observations must be inter-compared and tested. To my knowledge, only one test was successfully carried out inter-comparing two indirect-method software and it proved their consistency (Dawson et al. 2007, J Geodesy). This mandatory phase of the harmonization process was identified as crucial during the San Francisco WG meeting but had no follow up.

Tie vectors residuals were recently released as a by-product of the recent ITRF2008 combination. Their values are currently being investigated for assessing critical situations at the co-location sites. A close cooperation with the ITRS Centre and the ITRS Combination Centres is compulsory and is part of the ongoing investigation. The WG needs closer cooperation with the single technique services in order to investigate further the role of PCV to connect the Electronic and Conventional reference points of the different geodetic instruments and remove the possible biases. Particularly, the cooperation with IVS, IDS and ILRS must be strengthened.

During the EGU2010, the session “The Global Geodetic Observing System: Tying and Integrating Geodetic Techniques for Research and Applications” attracted contributions that covered several aspects relevant to the WG activity.
Convener: Pierguido Sarti; Co-Conveners: Richard Gross, Erricos C. Pavlis, Manuela Seitz

Session details: IAG’s Global Geodetic Observing System (GGOS) provides the means for integrating ground- and spaced-based observations of geodetic techniques. Nowadays, large inter-technique residuals are found in combinations and they reflect the presence of discrepancies whose nature and origin are not well understood. Modernization of geodetic infrastructures and homogeneous processing of geodetic data are essential to reduce discrepancies and support consistent observations of Earth’s time-variable surface geometry (including ocean and ice surfaces), ocean currents, mass and volume changes.

This session was a forum to discuss integration of geodetic techniques, the actual discrepancies highlighted by the combinations, their possible causes and corrections, as well as novel plans and strategies for development of infrastructures and their application to Earth’s surface monitoring.

Twelve oral and twenty one poster contributions were eventually presented and helped outlining the state-of-the-art on the WG activities.

Pierguido Sarti