

Recommendations

Focused on the respective content of the session several blocs of recommendations have been discussed. There are some overlappings between the session oriented recommendations but for completeness the recommendations are published as presented.

Session 1: "Co-location sites in ITRF"

Recommendations prepared by Zuheir Altamimi with contributions of Angelyn Moore, Axel Nothnagel, Van Husson and Hervé Fagard

Some important recommendations related to local surveys and collocation sites were already addressed during the IERS Workshop in Munich 2002 (Altamimi et al, 2002). These recommendations are reproduced, emphasized and augmented below.

Recommendation 1:

In order to improve collocation sites distribution and observing networks:

- International effort is needed to improve VLBI-SLR collocations by installing new SLR systems (e.g. SLR2000) at all VLBI sites. These are very critical for the long term TRF scale maintenance.
- IVS is urged to schedule repeated Global-TRF observing sessions;
- IDS is asked to consider installing DORIS beacons at all SLR and VLBI sites, starting with sites collocated with GPS in order to augment the number/distribution of the 4-technique "primary" sites.

Recommendation 2:

The Working Group on Local Ties is asked to organize repeated (yearly !) local surveys in the all available collocation sites. Per-site local tie components (at the survey epoch) and their time variations should be provided in SINEX format with full variance-covariance matrix. The priority list of sites (re-)surveys should be organized as follows:

- start with sites where local ties are missing and critically dubious, e.g. Shanghai
- after Earthquakes, e.g. Arequipa, Fairbanks
- Sites for which full SINEX files are not available, so that ultimately all collocation sites should have local ties expressed in SINEX format.

Recommendation 3:

The IERS Directing Board is asked to consider establishing Associated Analysis Centres for Local Ties survey and analysis, analogous to the existing Analysis Centres of space geodesy techniques.

Recommendation 4:

For the long term maintenance of collocation sites and thus the ITRF global stability, the urgent action is to envisage new design of ITRF Core Collocation Sites (ICCS), the indispensable "ITRF Pillars", with global coverage, stable and solid monumentation, regularly/repeatedly surveyed and geophysically monitored.

Session 3: "Analysis and SINEX"

Recommendations prepared by Pierguido Sarti and Detlef Angerman with contribution of John Dawson and Patrick Sillard

The following recommendations are issues of the future IERS working group on Survey.

Recommendation1:

A clear definition of RPs be developed by the analysis communities for each technique.

Recommendation 2:

In every cases a geodetic marker is materialized and an accurate eccentricity is re-estimated every time the local tie survey is performed.

Recommendation 3:

The Space geodetic analysis and local tie community develop new local tie products for use in analysis (e.g.: skew angle, tilt angle, wobble, structural deformations...).

Recommendation 4:

Standardized campaign procedures for homogeneous and accurate results should be adopted.

Recommendation 5:

A priori simulation of terrestrial observations should be undertaken so as to assess the impact of the survey design.

Recommendation 6:

The direct, hybrid and indirect approaches to RP determination must be compared.

Recommendation 7:

Different indirect methodologies and software must be evaluated.

Recommendation 8:

A pilot project should be set up: ad hoc survey at a representative co-location site.

Recommendation 9:

Standards on raw terrestrial data archiving and sharing must be developed.

Recommendation 10:

Agreement on type and number of stations to be included in SINEX.

Recommendation 11:

Agreement on reference frame in which local ties are expressed in SINEX and how they are mapped.

Recommendation 12:

Agreement on the generation of SINEX files (e.g.: which blocks are mandatory and which constraints are applied).

Session 5 “Workshop summary”

Recommendations prepared by Markus Rothacher, IERS Analysis Coordinator

Recommendation 1:

All local ties between co-located instruments should be determined with an accuracy of 1mm or better in the ITRF (global, cartesian) and the full variance / covariance information should be made available in SINEX format.

Recommendation 2:

Local survey measurements should have the same importance as and should be treated like any of the space geodetic techniques

Recommendation 3:

A database should be established at the IERS CB for all information in connection with site co-location (list of co-location sites, local ties in SINEX, co-location instruments, site maps and pictures, survey reports, survey status, site events and history, ...)

Recommendation 4:

Site coordinates (VLBI, GPS, SLR, DORIS) should be better tied to the ground. The local tie information should therefore be of such a quality that they can be assumed true (enforced) for the combination.

Recommendation 5:

A priority list of sites to be surveyed has to be agreed upon and a list of institutions willing to participate in survey activities (survey instruments and personnel) should be maintained

Recommendation 6:

A list of local survey analysis programs in use should be collected with the characteristics of the individual software packages

Recommendation 7:

Two different solutions (SINEX ?) should be generated, one in a local reference frame (no degradation by orientation information) and one w.r.t to the ITRF.

Recommendation 8:

All GPS sites close to other techniques should be part of the IGS routine processing.

Recommendation 9:

Standards have to be defined on how local survey results are saved in SINEX files (mandatory blocks, format modifications, constraints, NEQ and/or VAR/COVAR ...)