第14回TDC会議資料@鹿嶋（1999．3．1．）

複数宇宙測地技術による広域地殻変動観測に関する国際ワークショップ開催報告

International workshop on GEodetic Measurements by the collocation of Space Techniques ON Earth

（*GEMSTONE*）

宇宙測地技術の持つ長所・短所を組み合わせの利点を生かした総合化と、特に観測施設を併設するコロケーションにより、基準座標系および地殻変動観測に寄与するための国際ワークショップを開催した。また、会期中に APT(Asia-Pacific Telescope)及び APSG (Asia-Pacific Space Geodynamics)のセッションも設けた。

テーマ

- observations at the collocated stations
- data analysis combining the space geodetic techniques
- technical problems of collocation, including local surveying
- terrestrial reference frames
- technical issues in the APT and APSG, including celestial reference frames

Scientific Committee
J. Bosworth (GSFC，米)、Z. Altamimi (IGN，仏), G. Beutler (Bern，ｽｲｽ)、
T. Herring (MIT，米)、J. Manning (AUSLIG，豪)、M. Pearlman (HSCA、米)、
W. Schlueter (BKG，独)、T. Yoshino (CRL,日)
APT/APSG
S. Ye (Shanghai Observatory，中)、D. Jauncey(CSIRO，豪)、R. Govind(AUSLIG，豪)
M. Inoue(NAO,日)

とき　：平成 11 年1月 25 日(月)～28 日(木)
（1月28日は、国土地理院及びNASDA宇宙センターへの scientific excursion）
ところ　：郵政省通信総合研究所
主催:科学技術庁、科学技術国際交流センター、郵政省通信総合研究所

参加者総数：103名
参加国数：日本を含め 12カ国

決議文の採択（以下はその主旨）

・宇宙測地のコロケーションの重要性を認識し各国でのコロケーションを推奨
・ローカル測量の重要性を指摘
・SINEX フォーマット
・コロケーションを宇宙にまで展開すべきこと
・議論はCSTGの GGSS（測地観測局情報に関する委員会）に引き継ぐこと
・ISGN（国際宇宙測地網）を推進すべきこと
・宇宙測地技術間の協力を緊密にすべきこと
・コロケーション局の均等分布のための新設局を支援
・リアルタイムVLBIの効率と安定性を地球科学に活用するため、IVS のTDCの支援のもとに国際的なパイロット実験を開始するための準備を始めるべきこと。
・IVS のTDCはVLBIシステムの互換性を確保するための標準ｲﾝﾀｰﾌｪｰｽ開発を支持する。

APT/APSG
・東西南北の広がりを利用した VLBI の位置天文、測地に貢献する観測に貢献。
・新規プロジェクトの支援（韓国VLBI、VERA、SELENE、1平方km望遠鏡）
・標準VLBIｲﾝﾀｰﾌｪｰｽ開発の支持
・天文と測地研究の緊密な連携

＜原文＞

Resolutions of the

GEMSTONE Workshop
Communication Research Laboratory

Tokyo, Japan,
January 27, 1999

The international workshop on Geodetic Measurements by the collocation of Space Techniques ON Earth (GEMSTONE) sponsored by the Science and Technology Agency of Japan was held at the Communications Research Laboratory in Tokyo from January 25 to 27, 1999.

RESOLUTION 1

The participants of the GEMSTONE Workshop express their sincere appreciation to the Communications Research Laboratory of Japan and the Local Organizing Committee for their hospitality and excellent arrangements for this very important and beneficial meeting. The participants also thank the Science Committee for its guidance and organization for this meeting.

RESOLUTION 2

The GEMSTONE Workshop,

considering that;

a) the collocation of space geodetic measurements (GPS, DORIS, PRARE, SLR, VLBI) is required for the improvement of the terrestrial reference frame;

b) the collocation of space geodetic measurements is of great benefit to improving the performance of the

individual space geodetic measurement techniques;

c) high accuracy local ground survey ties between collocated systems are as important as the space geodetic measurements for collocation data analysis;

d) monitoring of the long term stability of site monumentation and calibration targets is indispensable for the interpretation of geodetic results, including collocation analysis; and

e) collocation of geodetic systems on spacecraft is beneficial for accurate positioning in space and on the Earth;

urges the international space geodetic community to:

1) coordinate efforts to improve the reference frame by connecting the different space geodetic techniques through collocation;

2) recognize the importance of local geology in the selection of sites and the need for regularly repeating local surveys to monitor stability;

3) clarify and openly publish the methods and data bases of the ground surveys at each station as well as the results;

4) provide all results in full SINEX format for ease in collocation analysis;

5) consider the implementation of collocated geodetic systems on spacecraft, the Moon and planetary bodies;

6) continue discussions and actions related to the above items through the Geodetic and Geophysical Sites Subcommission (GGSS) of the CSTG in collaboration with the IERS Terrestrial Reference Frame Section;

7) support the establishment of the International Space Geodetic Network (ISGN) site and analysis criteria and their implementation at all major collocation sites;

8) establish regular collaborations among the space geodetic services (IGS, ILRS, and IVS) to enhance collocation activities and to plan joint strategies for exploiting the strengths of the individual techniques; and

9) support the establishment of new collocation sites for improved geographic coverage;

RECOMMENDATIONS

The Workshop also discussed the efficiency and stability that real-time VLBI could provide for geodetic observations, and VLBI's capabilities in Earth rotation monitoring and crustal deformation. The Workshop supports actions to start a real-time VLBI capability through a series of international data communication pilot experiments under the auspices of the International VLBI Service (IVS) Technical Development Centers.

The Workshop also supports active efforts by the IVS Technology Coordinator to develop an international standard for VLBI interfaces that will provide compatibility among heterogeneous VLBI data transport systems, thereby facilitating collocation measurements.

Resolution of the APT/APSG

1) The APT/APSG resolves to undertake a precision VLBI S/X astrometry program in support of the ICRF for Equatorial sources. The APT telescopes have particularly good N-S and E-W coverage with Urumqi and Kokee. Such a program supports both the astrophysical and geodetic goals of the APT/APSG.

2) In the spirit of international friendship and collaboration, the APT/APSG strongly encourages and supports new projects related to the activities of this Workshop. Such projects include:

   * The Korean VLBI Network,

   * The Japanese precision VLBI astrometry Project VERA,

   * The precision astrometry Project SELENE, and

   * The regional 1 square kilometre telescope developments in China and Australia.

   The APT/APSG believes that these new projects can stimulate the related research activities and also improve the quality of regional scientific research and collaboration.

3) The APT/APSG supports the initiative to develop a standard VLBI Interface Specification, being considered by the IVS. We also encourage the IVS to include the radio astronomy community in this initiative at the earliest possible time.

4) The APT/APSG wishes to encourage closer collaboration between the Astronomy and Geodesy communities, to the advantage of both communities.