1) INTRODUCTION

The Global Positioning System (GPS) becomes more and more an important technique used for geodetic and geodynamic purposes at a local as well as global scale. In the same way as SLR, LLR and VLBI, GPS has to play its role as part of the IERS activities. Conversely, the IERS has to supply to GPS analysis centers relevant materials in terms of Earth rotation and reference frame, in order to ensure the complete integration of the GPS within IERS. In this direction, this Technical Note intends to produce a global GPS Terrestrial Reference Frame expressed in the IERS Terrestrial Reference System (ITRS) to be used for GPS analysis. This product is based on a combination of the ITRF90 solution which is the up to date realization of the ITRS and local tie vectors between GPS tracking points and SLR or VLBI points.

2) INPUT DATA

2.1) Sites included

The sites considered here are those which are already IERS sites (SLR or/and VLBI sites) and where GPS antennas have been installed, temporarily or permanently. These sites belong to CIGNET network, GIG91 campaign, DMA and OCS tracking network. They are included in Table 1 which lists all the IERS sites known till now.

More details about points and marks within these sites are listed and described in Table 2.

The points located in these sites for which we provide coordinates are GPS L1 phase centers of the antennas as well as GPS monuments or marks in the case where the local ties between these GPS points and SLR or VLBI points are available.

2.2) The ITRF90 set

The ITRF90 station coordinates included in this computation are those corresponding to the sites described above. Two reference epochs were selected: 1991.0 and 1992.0. Since no velocity field has been adjusted in the ITRF90 solution, the AM0-2 model was used in order to estimate the ITRF90 positions (whose reference epoch is 1988.0) for the two selected epochs.

2.3) Eccentricities

40 local tie vectors between GPS points and SLR or VLBI points have been identified and listed in Table 3. These values were used with a proper a priori variances which are listed in Table 3 on the second line of each local tie vector.