

IGS

**SESSION 7:
GLOBAL NAVIGATION SATELLITE SYSTEMS I**

Session Description

Chairs: J. Dow, R. Weber

The session discusses the Mission Segment of the upcoming GALILEO Satellite Navigation System and aims at presenting major characteristics of GALILEO like Signal Design, Orbit Determination and Reference System Time. Contributions on new developments in GPS are solicited. Furthermore Interoperability Issues between GALILEO and the existing systems GPS and GLONASS will be discussed. The performance of combined GPS/GALILEO user receivers and expected synergies of dual or triple system use may also be topics.

Session Summary

J. Dow, R. Weber

The first GNSS Session started with a paper presenting details of the upcoming modernization of the GPS System by M. Shaw, Director, Navigation and Spectrum Policy (US Department of Transportation). The modernization concerns two aspects, on one hand a significant densification of the ground segment including improved broadcast orbit determination and on the other hand, the number of signals provided by the new GPS II-RM satellites will also increase (new L2C and M-Code) considerably. In addition, the GPS II-F satellites, scheduled for launch from 2006 onwards, will provide a new civilian signal on L5 and should therefore enhance ambiguity resolution techniques significantly. The presentation was made by D. Turner, Director, Executive Secretariat, US Inter-Agency GPS Executive Board.

Dr. F. Arias, Head of Time, Bureau International des Poids et Mesures (BIPM) focused her presentation on the activities of BIPM in establishing stable realisations of the international time scales. Moreover, she presented the most recent techniques used for time and frequency transfer. BIPM will be the organisation to provide the future Galileo System Time. Last but not least, the close partnership between BIPM and the IGS since 1997 was mentioned.

Afterwards M. Falcone, ESA Galileo Mission Segment Engineering Manager, presented the architecture of the upcoming Galileo Mission Segment (GMS). The GMS monitors the Galileo signal in space and is especially relevant for providing data products required for navigation and integrity services. He highlighted the results of the Galileo System Test Bed (GSTB)-V1 which has been installed by ESA to mitigate development risks and gave a first impression on the aims of the planned GSTB-V2.

The Spanish Company GMV was awarded contracts by ESA aiming at the development of Orbit Determination and Time Synchronization (OD&TS) algorithms within the GSTB-V1. A.M. Garcia, GMV GNSS Business Unit Company, summarized the results of this study focusing on the generation of prototype Galileo navigation and integrity data. In terms of integrity he especially explains the generation and meaning of the Signal in Space Accuracy (SISA) parameter which provides a bound of the ephemeris and clock errors at a certain confidence level.

The last paper was dedicated to the activities and goals of the IGS GNSS group, presented by the working group chair, Prof. Robert Weber, Technical University of Vienna and former IGS Analysis Center Coordinator. A stated objective of the working group is to pave the way for fully integrated IGS products comprising orbits, clock offsets, stations coordinates and atmospheric delays based on data from all available GNSS systems. The presentation mainly focused on recommendations to the Galileo System Design, which were prepared by the IGS GNSS Working Group to allow for a precise orbit determination of the upcoming Galileo satellites and for a close tie of the Galileo Reference Frame (GRF) to the International Terrestrial Reference Frame (ITRF).

