

GGOS AND THE COMBINATION OF SPACE GEODETIC TECHNIQUES

M. ROTHACHER

Department of Geodesy and Remote Sensing, GFZ Potsdam, Germany

e-mail: rothacher@gfz-potsdam.de

ABSTRACT.

The Global Geodetic Observing System (GGOS) is the contribution of geodesy to a global Earth monitoring system. In particular, it provides the metrological basis and the reference systems and frames, which are crucial nowadays for all Earth observing systems. GGOS is built on the IAG Services (IGS, IVS, ILRS, IDS, IERS, IGFS, ...) and the products they derive on an operational basis for Earth monitoring, making use of a large variety of space and ground-based geodetic techniques such as VLBI, SLR/LLR, GNSS, DORIS, altimetry, InSAR and gravity satellite missions, gravimetry, etc. All these observation techniques are considered integral parts of GGOS, allowing the monitoring of the Earth's shape and deformation (including water surface), the Earth's orientation and rotation and the Earth's gravity field and its temporal variations with an unprecedented accuracy.

GGOS, already now, is more than just an observing system. Its future vision and goal is the development of a complete chain from the acquisition, transfer and processing of a tremendous amount of observational data over the consistent combination and integration of all space geodetic techniques to the assimilation of the resulting geodetic and geophysical parameters into complex numerical models of the Earth system.

This presentation will concentrate on just one part of this chain, namely the issue of a rigorous combination and integration of the various space geodetic techniques in order to obtain unique highly accurate reference frames and consistent long time series of geodetic and geophysical parameters crucial for the assessment and prediction of global change phenomena. In future, this integration should not only include geometry, but also gravimetry and, in the more distant future, even observation techniques like altimetry, InSAR and seismology. The challenges on the way to such a combination will be discussed and examples will be given for the results already achieved.