

THE OPTIMUM CONVENTIONAL TERRESTRIAL SYSTEM DETERMINED BY VLBI AND SLR STATIONS *

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The optimum Conventional Terrestrial System (CTS) can be defined by accurate coordinates of some number of stations distributed homogeneously all over the world. There are scores of laser and VLBI stations whose coordinates are known with high accuracy of the order of 1–2 cm. There are many CTS defined by the sets of station coordinates determined in the process of determination of the Earth rotation parameters and the Earth gravity field. Presently existing stations are not distributed homogeneously on the Earth. They are located mostly in Europe and in North America. In this situation, the errors of orientation of axes and origin positions are not equal. Some of them, based on a small number of not homogeneously distributed stations, are not well-defined (stable).

In the complete paper various sets of different number of stations from 5 to 50, defining the optimum CTS, have been chosen from the IRIS nets of stations and GSFC sets of VLBI and SLR stations, GSFC88L01, GSFC88R01 respectively (BIH 1987; Carter *et al.* 1988; Ma *et al.* 1988).

Accuracies of CTS considered here were investigated through errors of 7 parameters of transformation of a CTS defined by adopted coordinates of considered stations. Results show that 15–20 well-distributed stations can define an optimum CTS with accuracy of the order of 1 cm or better. Further increasing the number of stations does not improve the accuracies very much.

Discussion

HUGHES: I neglected to mention yesterday that the WGRS is also concerned with terrestrial systems in the sense that cooperation is maintained with the IAG/IUGG.

YATSKIV: I was surprised to find in the optimal solution that the stations Onsala and Wettzell are so closely situated to one another.

KOLACZEK: It may be due to the high accuracy of the stations' relative coordinate determinations.

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