



A terrestrial reference frame based on homogeneously processed data

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Applications of global terrestrial reference frames (TRF) are widespread and accordingly the requirements to the TRF differ also very much. For geophysical investigations and applications in terms of global change highest accuracy, an internal consistency of the frame and a high availability in time and space are very important. The project GGOS-D initiated by four German institutions is aimed at the realization of a global terrestrial reference system which fulfils these requirements. Therefore the VLBI, SLR and GPS observation data are homogeneously processed after adapting the specific software packages concerning models and parameterization. The resulting daily constraint free normal equations are the input data for the computation of the reference frame. In the first part of the computation the data of each space geodetic technique is analyzed separately and the time dependency of the station positions is accounted for by setting up linear velocities as well as new positions in the case of discontinuities. Within the second part the combination of the different techniques is done. One very important task here is the selection of terrestrial difference vectors, as partly large differences between the terrestrial difference vectors and the observations of the space geodetic techniques occur. In order to obtain a TRF with highest consistency an appropriate selection strategy was developed: We compute different combined solutions using different pre-selected sets of terrestrial difference vectors for the combination of the station networks. The EOP are still uncombined. For the selection of the difference vectors we require that the offset between the uncombined pole coordinates is close to zero. Second, we claim that the deformation of the station networks due to the combination should be minimal. The results show, that the application of this selection strategy allows for the computation of a TRF solution of highest consistency and accuracy.