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Accuracy evaluation of the terrestrial reference frame

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In its function as an ITRS Combination Center DGFI has devoloped methods for an improved realization of the terrestrial reference frame (TRF). The refined approach applied for the ITRF2005 computation is based on the combination of epoch normal equations (weekly / daily data sets) containing station positions and Earth orientation parameters (EOP). The new strategy allows to account for nonlinear effects in site motions and ensures consistency between the TRF and the EOP. We present results of the ITRF2005 computations and focuss thereby on the accuracy evaluation of the terrestrial reference frame. The time series solutions provide valuable information to quantify the internal accuracy of the contributing space techniques derived from the repeatabilities of the estimated station positions. A comparison of the results at co-location sites allows to assess common signals and to identify possible biases between different techniques. Therefore the space geodetic estimated positions of co-located instruments are compared with local tie measurements. As common parameters of the different space geodetic techniques the station velocities at co-location sites and the EOP contribute to evaluate the accuracy of the ITRF. Finally the results of the inter-technique combination are analysed and compared with solutions of the two other ITRS Combination Centers to assess the overall accuracy of the ITRF.