Coordinates for the ITER Project

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ABSTRACT:

ITER is an outstanding joint research project of European Community, Japan, Russia, China, Korea, India and USA. At present for the ITER project a huge research facility is under construction in southern France. ITER is an experimental fusion reactor based on the "tokamak" concept. The objective is to show whether or not it will be possible, from the physical and technological point of view, to generate energy by nuclear fusion for production of electrical energy.

In this paper we will present the establishment and optimisation of the basic geodetic network for the complete ITER project. This network will provide the coordinate frame for all outdoor and indoor activities during the ITER project. For this geodetic network then the observation strategy will be explained, which is based on a combined use of total stations, differential GPS and levelling. Subsequently, the adjustment approach for a rigorous, datum-free processing of these combined data sets and the basic concepts of classical congruency tests for checking the stability of the stations are explained.

Up to now three measuring campaigns are performed and analysed. Generalised results on the combined adjustments are presented, including precision and reliability aspects. Finally a preliminary estimate on the stability of stations will be given, as well.