DATUM DEFINITION IN DENSIFICATION NETWORKS

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ABSTRACT

The increasing interest on small and medium precise networks installed as a base for very large scale mapping or for engineering purposes and the combined use of classical and GPS measurements put forward again the problem of the connection of the densification networks to the primary or fundamental ones. The errors on the co-ordinates of the superior points influences the precision of the densification points introducing distortions which have to be added to those due to the measurements. We have to minimise and distribute these distorsions in the whole network following the two opposite ideas expressed by Pelzer who distinguished the systems of networks as dynamic and hierarchical systems, or following some intermediate way.

There is a very interesting literature on this subject mostly in the seventies and in eighties when there was the problem of the connection of very precise densification networks to old and less precise primary networks. Nowadays, with the re-measurement of the primary networks by GPS, the precision of the various networks can be considered comparable and the concept of hierarchical system of networks can be easily applied.

Starting from a review of the major contributions to the problem (interpolation, interpolation by collocation, local filtering, ...) in which are involved many important colleagues (Moritz, Baetslé, Halmos, Papo, Kubacek, Buiten, etc.) we present some open problems and some solutions using the six parameters transformation for the two-dimensional networks and the nine parameters transformation for the three-dimensional ones.