



Using GNSS Antenna Models for Georeferencing of Scanned Data

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The coordinates of scanned points originally are expressed in a local reference system referred to the centre of the scanning device. To perform transformation to a well-defined system, it is required to have some points, with determined coordinates in the secondary system, that are well-seen and well-distinguishable on the scan. This would enable computation of transformation parameters. In some situations, especially when the scan data are acquired from a moving platform, like a road-vehicle, train, boat etc., it is not easy to fulfill the condition of the known points being well-distinguishable on the scan. It can cause a problem, especially when scan data should be given accurately in the secondary system. Some methods have been used in practice to solve this problem, like e.g. mounting spheres made of reflective material such that the sphere centers have well-determined locations in desired system. This method is very laborious and does not give very good results.

A new method for georeferencing the scan data in land applications is proposed in the paper. It consists in using directly GNSS antennas instead of the spheres. The antennas themselves are well seen on the scan. On the other hand their accurate geometrical models are well known and published. Also, the phase centers are well defined relative to antenna geometrical shape. Simultaneous taking advantage of geometrical elements of the antenna seen on the scan together with the phase center models makes it possible to determine uniquely the scan coordinates of the antennas phase centers. The latter are positioned using Polish permanent network ASG-EUPOS. Using enough number of antennas it is possible to perform exact transformation.

Some experiments were performed to assess and study this method. The paper is devoted to discussion of the results.