Mathematical Model and Results of a New Positioning Algorithm

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SUMMARY

A new mathematical model is briefly described, and a new positioning algorithm is announced. Obtaining the solution from the non-linear system of equations is not trivial as presented by numerous publications. One of the most important problems still to be solved in the 21st century is the problem of non-linearity of equations. Observations are linearized to solve the problem of positioning – such as the distances or the pseudoranges. Moreover, most positioning solutions are based on numerical computations. In this article the basic principles of the methods for solving the positioning problem are presented, and the formulas and their derivation are given. The numerical example with simulated data and proof confirm the correct performance of the proposed algorithm. A new algorithm for determining of the point coordinates and a systematic error in two-dimensional space in geodetic network solution is presented. In the proposed solution there is no need to know the initial approximate location of the determined point, nor the coordinates of the transition points.

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