A new ellipsoidal Boundary Value Problem approach to telluroid and quasigeoid computations

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In this paper a new ellipsoidal Boundary Value Problem (BVP) for telluroid and quasigeoid computations, according to Molodensky's definition, is presented. The presented BVP can solve the problem of potential value computation on the surface of the Earth, which when applied to a mapping scheme, e.g. minimum distance mapping, provides a point-wise approach to telluroid computation. Besides, we have succeeded to reduce the number of equations and unknowns of minimum distance telluroid mapping by one. The sufficient condition for the existence of the solution of minimum distance telluroid mapping, which was wrongly presented before, is also corrected. Since the introduced BVP has the advantage of implementing various gravity observables simultaneously as input boundary data, it could be regarded as a data fusion technique, and makes it possible to take advantage of all available gravity data resources within a BVP. The developed BVP is used for the computation of the quasigeoid within a test area in South-West of Finland.