



# EXPLICIT SOLUTIONS FOR GEODETIC PROBLEMS ON THE DEFORMED SPHERE AS REFERENCE MODEL FOR THE GEOID

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In this article, we consider deformed spheres as a new reference model for the geoid, alternatively to the classical ellipsoidal one. The parametrization of deformed spheres is furnished through the incomplete elliptic integrals. From the other side, the solutions for geodesics on those surfaces are given entirely via elementary analytical functions, contrary to the case of ellipsoids of revolution. We explicitly described algorithms (all necessary computational steps) for the solution of the direct and inverse geodetic problems on the deformed spheres. Finally, we presented a few illustrative numerical solutions of the inverse geodetic problems for two conceptual cases of near and far points. It had turned out that even in the non-optimized case we obtained the good agreement with the predictions of the World Geodetic System 1984's ellipsoidal reference model.

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