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Theoretical Aspects of Relativistic Geodesy

Abstract

The main objective of Geodesy is to determine the (mathematical and geometrical) figure of the Earth and its properties. I will first introduce conventional geodetic concepts and notions such as reference surfaces (e.g. the geoid) and height definitions (e.g. orthometric height) in Newtonian gravity. Then, within the framework of General Relativity the aforementioned concepts will be investigated again and redefined w.r.t. rigidly comoving observer congruences. In particular, I comment on the relativistic geoid and the magnitude of leading-order relativistic corrections.