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Analytical computation of tidal deformation on the solid Earth
A toolkit for GNSS users

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Accurate positioning by Global Navigation Satellite Systems (GNSS) like GPS requires various correction and considerations. Tidal effect on the position of points on the solid Earth surface is among those corrections which many users are unaware of it or do not know how to handle it. Knowing relative position of the Sun, Moon and the Earth from orbital astronomy, and also knowledge of the masses of those heavenly bodies, the tidal force on the solid Earth is computed and based on the elastic Earth model, time dependent displacement field due to the tidal forces is derived. The authors used the aforementioned method and developed a computer program for computing temporal 3-D tidal displacement field, which can be used by GNSS users to compute the tidal correction to computed GNSS positions. Though similar correction formulas are implemented in some GPS softwares like BERNESE but many users are unaware of this correction and as such the developed program can be used as an aid for accurate application of GNSS. Theoretical details and test computations are presented in the paper.