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# Ocean Tide Model Uncertainties For Electromagnetic Inversion Studies

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Electromagnetic signals generated by oceanic tides are increasingly used to infer physical properties of Earth's mantle, e.g., electric resistivity and water content. The inferences usually compare measured and modelled electromagnetic tidal signals. The resulting discrepancies are used to update prior information about the mantle's electrical properties. Consequently, errors in modelled and observed tidal signals may result in faulty updates of the prior information. The tidal signals are detected by satellites with increasing precision. The incorporated tidal models are usually assimilative barotropic models. The modelled signals are considered free of errors in these electromagnetic inversion studies. However, our study presents errors of the modelled electromagnetic tidal signals and closes a gap in the respective error budget. At satellite height, the differences between purely hydrodynamic tidal models reach up to 2nT, i.e. over 100% of the local M2 signal. The more often used assimilative tidal models show smaller differences of up to 0.1nT, which in some locations still correspond to over 30% of the M2 signal.