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Weighing the ocean with bottom-pressure sensors: Robustness of the ocean mass annual cycle estimate.

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The annual cycle of water exchange from the ocean to land and atmosphere can be measured using bottom pressure sensors. After removing instrument drift, ocean dynamics (from models), atmospheric pressure and tides, the remainder is the global average ocean mass change, with a local correction due to gravitational self-attraction and crustal loading. We use data from 17 tropical deep ocean sites to estimate the uncertainties of this technique. We demonstrate how short records from separate sites can be combined, and present a result broadly consistent with data from GRACE, satellite altimetry and other methods.
Bottom pressure recorders suffer from substantial drift which is usually removed by with a linear + exponential fit. We show that the ocean annual mass cycle can contaminate this fit, and particularly for records of less than 18 months it is essential to include this for correct drift removal.