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Low-Pass Filters to Suppress Inertial and Tidal Frequencies

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ABSTRACT

A systematic way is given to design digital filters which allow clear separation of signals with periods of a few days from noise of higher frequency, particularly tidal and inertial. Several examples are given which pass little high-frequency power and none at the principal tidal frequencies. The Lanczos–cosine filter passes too much energy near diurnal frequencies; the Godin filter is better but not optimal. A longer filter is recommended, with flat low-frequency response, a sharp cut-off and very low noise. For current meter records containing inertial motions, it appears desirable to design a filter which specifically suppresses the local inertial frequency.

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