Figure X shows surface dynamic height relative to .... computed from Spray in situ density measurements. Strong variability clouds the large-scale structure of raw dynamic height. If this signal is treated as a time series, the time-lagged structure function shows dynamic-height to be dominated by variability with a 12-hour period with a bandwidth of about 1/4 day^{-1}. We hypothesize that this variability is a consequence of a combination of solar and lunar semi-diurnal internal tides that modulate the density field. A combination of the movement of Spray through the finite-wavelength internal waves and variability of currents between the internal wave's source and the observation point could broaden the bandwidth of this signal.

Under the assumption that the high-frequency variability of dynamic height results from the semi-diurnal tide, a filter was constructed to remove this tidal signal. Taking the dataset of dynamic heights to be the vector **d**, the filter output is $\hat{\mathbf{d}} = \mathbf{Ad}$ where the filter weights **A** are chosen to completely remove any signal of the form $\sin(\omega t + \phi)$ where ω is two cycles per day while minimizing (in the manner of objective mapping) the mean square error $<| \mathbf{d} - \hat{\mathbf{d}} |^2>$ when the time-lagged covariance of dynamic height is stationary (in time) and has the form $E_o \exp(-t^2 / 2\tau^2)$. Figure X shows the filtered signal when the covariance time scale τ is 1.5 days. Subsequent geostrophic transports and dynamic height differences are based on the filtered data.