Figure S1. Checks for the history force calculations. For (a) and (b) a single particle starting at $(14.50°W, 54.74°N)$ was used for the analysis. (a) Value of Mei/Adrian history force as function of the time window used in the trapezoidal method. A summation timestep of $\Delta t_h = 1$ s was used. The values are normalized by the value found with $t_{\mathrm{window}} = 20$ h. The calculation was done for different $c(\mathrm{Re}_p)$ and $c_p(t)$ as indicated by the legend. (b) Value of Mei/Adrian history force as function of the summation timestep Δt_h in the trapezoidal method. The values are normalized by the value calculated using $\Delta t_h = 0.1$ s. The calculation was done for different $c(\mathrm{Re}_p)$ and $c_p(t)$ as indicated by the legend. (c) Log-normal probability distribution of the Oseen time measured over the entire particle ensemble for different $c(\mathrm{Re}_p)$ and $c_p(t)$ as indicated by the legend.