

SUPPLEMENTARY MATERIAL

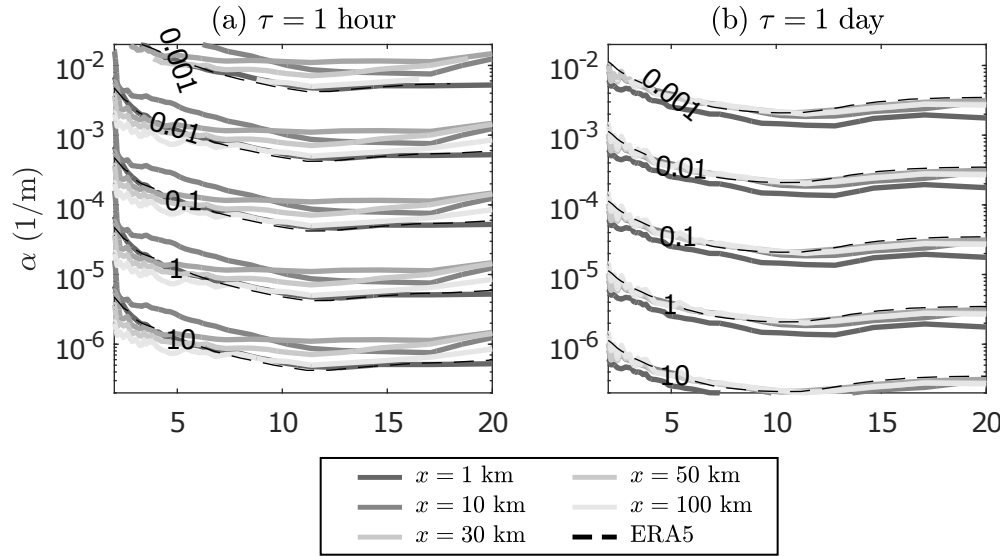


Figure S1: The 95% confidence interval of the error $(\bar{\alpha} - \alpha_{th})/\alpha_{th}$ (contours) for averaging periods τ of (a) 1 hour and (b) 1 day, for drifting wave buoy data (see Methods of main manuscript). Unlike ERA5 data, error of wave buoy data varies with x (see grey scale contours). The error of the ERA5 dataset is given by the black dashed line.

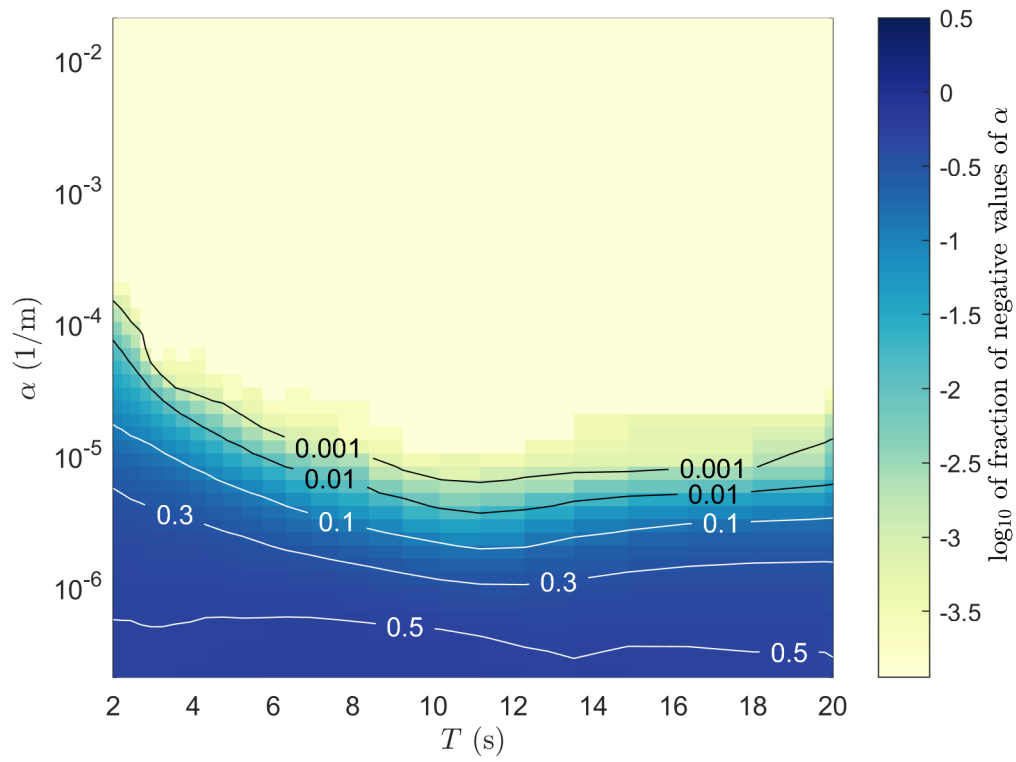


Figure S2: Fraction of negative values within each time series of α for different values of α_{th} and wave period T , given $\Delta t = x/c_g$.

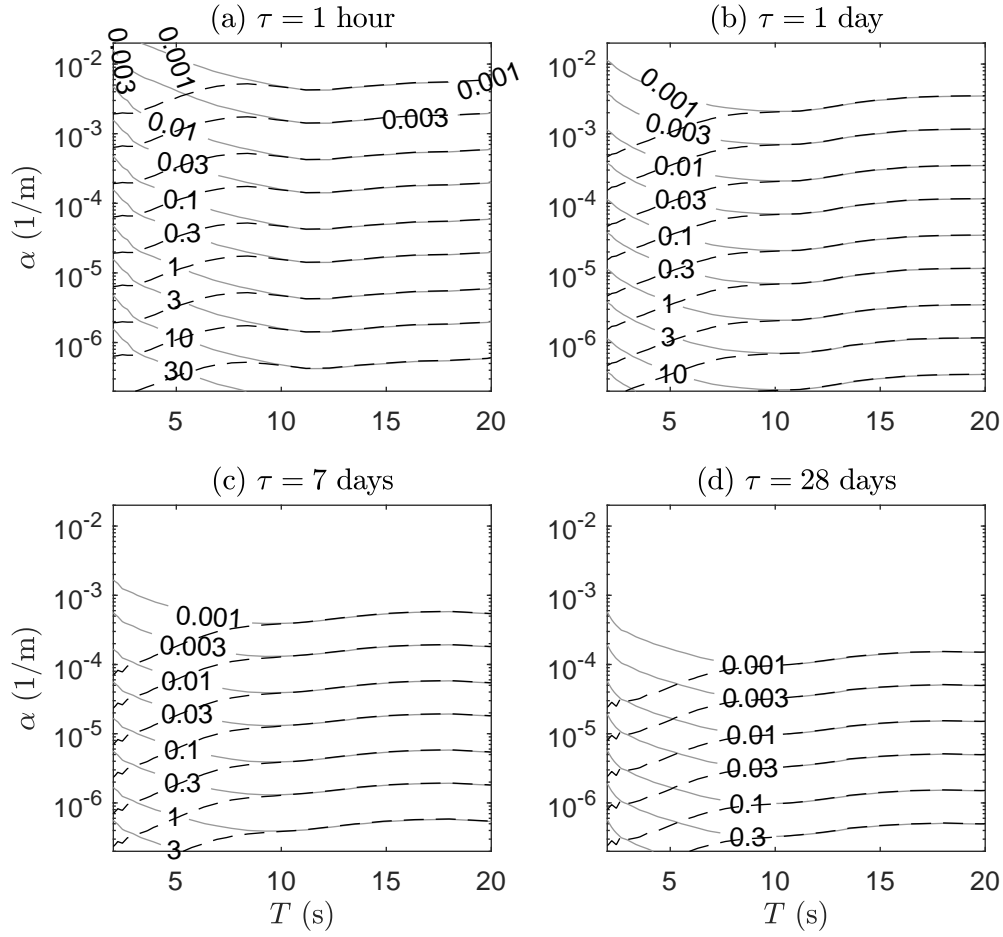


Figure S3: The 95% confidence interval of the error $(\bar{\alpha} - \alpha_{th})/\alpha_{th}$ (contours) for averaging periods τ of (a) 1 hour, (b) 1 day, (c) 7 days and (d) 28 days, all for ERA5 data. Grey contours represent the error when c_g is determined by the open water dispersion relationship, black dashed lines represent the error for c_g in consolidated ice, with ice thickness of 0.5 m and Young's modulus of 3×10^9 GPa, see results section of main manuscript.