Supplement 2. Estimation of *Eapp* by considering the effect of cell size

To consider the effect of cell size, we constructed a multiple linear regression model following the notations in the main text:

(1)

in which *V* is the cell volume (μm3) and *α* is the size scaling coefficient of the growth rate, determining how phytoplankton growth rate changes with *V* after controlling the temperature effect. The detailed results are shown below in Table S1.

Table S3. Estimated *Eapp* and *α* (Mean ± SE) of both autotrophs and heterotrophs by considering the effect of cell size (Eq. S1). *N*: number of data points used in regression.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Eapp* (eV) | *α* (μm-3) | *N* | *R2* |
| Autotrophs | 0.35 ± 0.01 | -0.082 ± 0.006 | 2661 | 0.24 |
| Heterotrophs | 0.71 ± 0.02 | -0.079 ± 0.010 | 704 | 0.54 |