I have reviewed the manuscript egusphere-2026-3713 by Bats et al. The authors describe a model to explain carbon fractionation by marine phytoplankton that takes into account most of what is known or presumed to be known about the relevant processes. It is apparent from figure 10 that the model accounts for most of the variance (85%) of measured ε_p values.

The authors unfortunately fall into the trap of concluding that if the model does not fit the data, there must be something wrong with the data. For example, the authors say, "Bidigare et al. (1997) found similar ε_p values between the diploid calcifying and haploid non-calcifying *G. huxleyi* which suggests no effect of calcification on ε_p using a chemostat culturing setup with a constant washout rate. However, this method has been criticized for producing ε_p values that may not reflect natural conditions, as the diluton rate may be too high to allow the DIC pool in the culture medium to reach isotopic equilibrium (Zhang et al., 2022). Therefore, their result may be affected by these equilibrium conditions." This is pure speculation, and in describing their methods, Laws et al. (1995: Dependence of phytoplankton carbon isotopic composition on growth rate and $[CO_2]_{aq}$: Theoretical considerations and experimental results. Geochim. Cosmochim. Acta **59**: 1131-1138) state that "Sampling for isotopic analysis of the particulate organic carbon in the growth chamber was not begun until the culture completed at least four doublings at a given growth rate and the $\delta^{13}C$ of dissolved inorganic carbon (DIC) in the growth chamber stabilized to ± 0.1 per mil." That is in fact exactly the recommendation made by Zhang et al. (2022) to avoid the possibility of isotopic disequilibrium. In truth, there is no reason to think that the results of Bidigare et al. (1997) reflect isotopic disequilibrium in the growth medium.

An alternative explanation for the results of Bidigare et al. (1997) is that the processes that occur inside the cell are more complex than envisioned by a mathematical model such as that of Bats et al. When Laws et al. (Sources of inorganic carbon for marine microalgal photosynthesis: A reassessment of $\delta^{13}C$ data from batch culture studies of *Thalassiosira pseudonana* and *Emiliania huxleyi*. Limnology and Oceanography **43**: 136-142 (1998) re-analyzed the data of Thompson and Calvert (1994, 1995), they concluded that CO_2 released through calcification was important at high growth rates in the Thompson and Calvert dataset. Interestingly, the $\delta^{13}C$ values of cellular organic matter decreased at high growth rates – opposite to the expectations of a supply/demand model. The explanation in this dataset was a shift from bicarbonate at low growth rate to CO_2 at high growth rates.