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Corrigendum to "Feedbacks between hydrodynamics and cold-water coral mound development" [Deep-Sea Res. 178 (2021) 103641]

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The authors want to inform you about the following two errors in the paper 'Feedbacks between hydrodynamics and cold-water coral mound development':

1. During formatting by the journal, a problem occurred with equations (4)–(7) and references to the equations in the text. In particular, the brackets indicating time-averaging disappeared in the published version of the manuscript. The full paragraph should read as follows.

"The energy conversion rate is calculated as (Gerkema et al., 2004; Gerkema 2019):

$$C = -\rho_*[bW] \tag{4}$$

with: $[\ldots] = T^{-1}\int_0^T (\ldots)dt$. Here t is time and the averaging interval T is taken as one tidal cycle. C has units of W m^{-3}.

We used the potential density in the calculation (4), because this is the quantity available from the model. This is however equivalent to using the perturbation density ρ' (as in (4), via b). Introducing C' based on the potential density, we find:

$$C' = -\rho_*\left[-\frac{g}{\rho_*}\rho W\right] \tag{5}$$

$$= -\rho_*\left[-\frac{g}{\rho_*}(\rho_0(z)+\rho'(t,x,y,z))W\right] \tag{6}$$

$$= -\rho_*\left[-\frac{g}{\rho_*}\rho_0(z)W\right] + -\rho_*\left[-\frac{g}{\rho_*}\rho'(t,x,y,z)W\right] \tag{7}$$

Since $[W] = 0$ and $\rho_0(z)$ is time-independent, the first term on the right side of (7) disappears and hence $C' = C$."

2. There was an error in the units of Figs. 5 and 6. The units reported in Fig. 5 for turbulent energy dissipation rates should be W/kg instead of W/m^3. Fig. 6 shows the depth-integrated turbulent energy dissipation rates, so here the units need to be Wm/kg. The unit error has no consequences for the conclusions of the paper, since we only compare the results qualitatively within our own simulations.

We would like to make a further clarification regarding the values of the turbulent energy dissipation rates. Our turbulent energy dissipation values are low when compared to measured dissipation rates, because of three reasons. First, we smoothened the bathymetry to study the dynamics around a coral mound without the effects of nearby protrusions. Furthermore, we calculated the dissipation rates at relatively coarse spatial scales of 250m (i.e. the model resolution) in the horizontal and up to 6m in the vertical (near the surface and bottom over steep topography), whereas turbulent dissipation rates are typically measured at scales of O(cm). Lastly, we used the classical formulation for turbulent energy dissipation by Thorpe (2007). Values for kinetic energy dissipation at the scales of our model could more realistically be calculated with other formulations that account for the larger spatial scale and the difference in horizontal and vertical scales (e.g. MacKinnon and Gregg 2003; Nikurashin et al., 2013), if a comparison with measured values or other studies is to be made (which was not the purpose of our study).

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