Supporting information, L78

From M_B, the volume of the bubbles (V_B) and their equivalent spherical diameter (d_B) at atmospheric pressure were determined, assuming that the CH_4 content in the bubbles ($\%_{CH4}$) is known, according to Eq. (S5) and (S6), respectively.

$$V_B = \frac{M_B}{16} \cdot \frac{R \cdot T}{P} \cdot \frac{1}{\%_{CH4}} \tag{S5}$$

$$d_B = 2 \cdot \sqrt[3]{\frac{3 \cdot V_B}{4 \cdot \pi}} \tag{S6}$$

where 16 is the molecular weight of CH_4 (g), R is the universal gas constant (L atm mol^{-1} K^{-1}), T is the temperature (K) and P is the atmospheric pressure (atm).

Since bubble volume and diameters are important for mass transfer determination during their migration to the lake surface, the actual bubble volume (V'_B) at a given depth (D) within the water column is given by Eq. (S7).

$$V'_B = V_B \cdot \frac{P}{\frac{(\rho \cdot g \cdot D)}{101{,}325} + P} \tag{S7}$$

where ρ is the water volumetric mass density (kg m^{-3}), g is the standard gravity (m s^{-2}), and 101,325 is the conversion factor from Pa to atm.