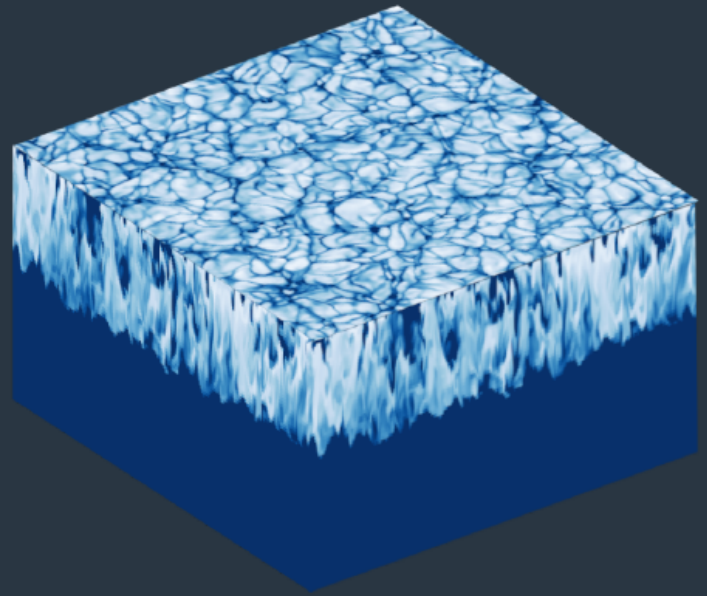
EDMF:
A model of Small-Scale Turbulence at the ocean surface



Single-Column Model:

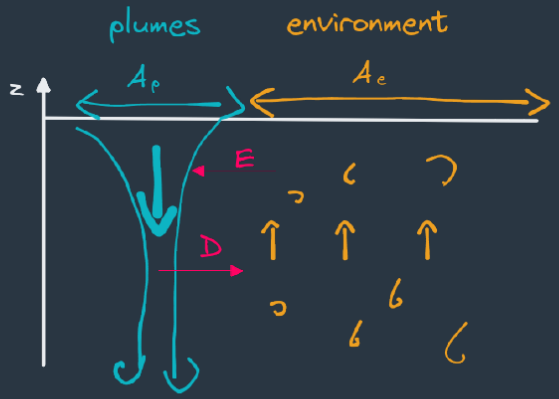
$$\partial_t \overline{X} = -\partial_z(\underbrace{-K\partial_z\overline{X}}_{\text{ED}} + \underbrace{a_p w_p(X_p - \overline{X})}_{\text{MF}})$$

Plume equations:

$$\partial_z(a_p w_p) = E - D \quad \text{(volume)}$$
$$\partial_z(a_p w_p \phi_p) = E\overline{\phi} - D\phi_p + S_\phi(\boldsymbol{C}) \quad (\phi = \theta, S, \boldsymbol{u}_h)$$
$$\partial_z(a_p w_p w_p) = -Dw_p + S_w(\boldsymbol{C}) \quad \text{(vert. velocity)}$$

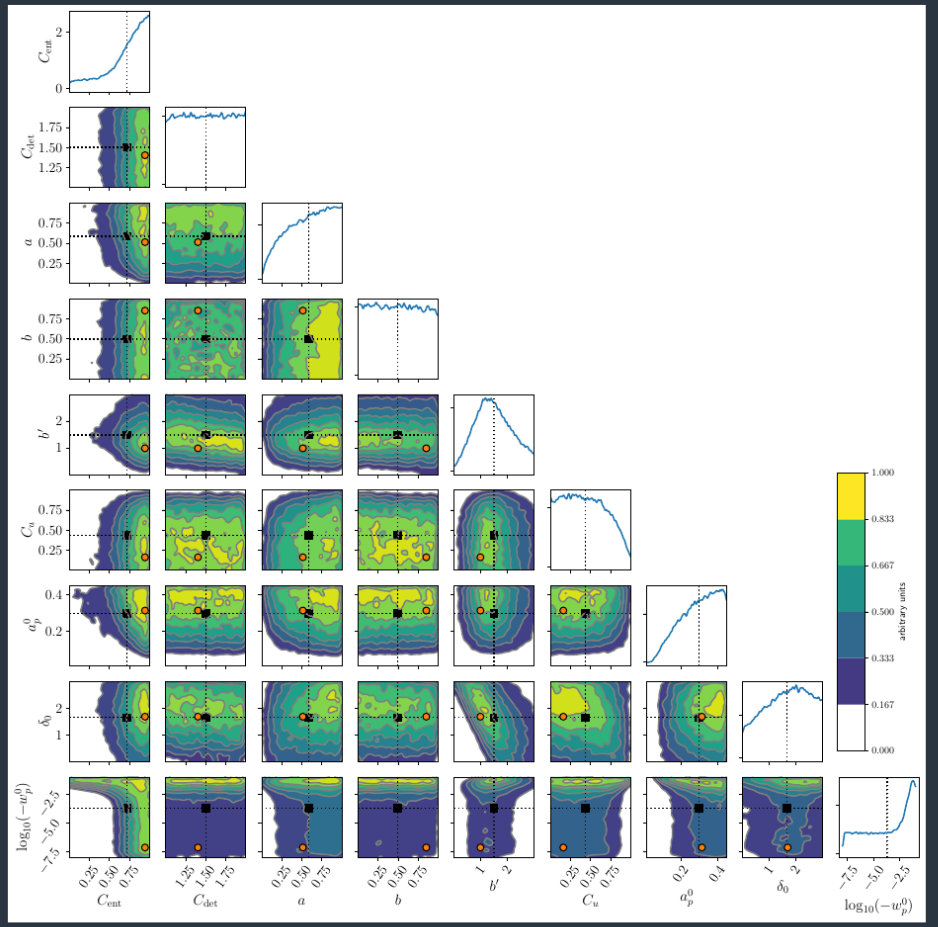
+ boundary conditions
+ parameters: $\boldsymbol{C} = (C_{\text{ent}}, C_{\text{det}}, a, b, b', C_u, a_p^0, \delta_0, w_p^0)$

+ TKE equation to compute $K = K(k)$



MCMC Sampling

- easy implementation with `Fortran to Python (F2PY)` interface
- ”Brute-force” random evaluation of the model
- 9 chains $\times$ 50 000 samples $\times$ 2 experiments $\longrightarrow$ 24h to run
- Reference solution



Looking for more efficient estimation method, in order to increase number of learning dataset.