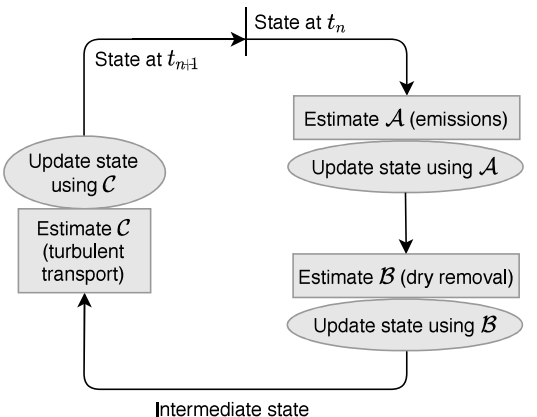


**(a1) Original scheme in EAMv1, flowchart description****(b1) Original scheme in EAMv1, pseudo-code description**

$$q^n \xrightarrow{\text{apply } A \text{ process for duration } \Delta t} q_A^{n+1}$$

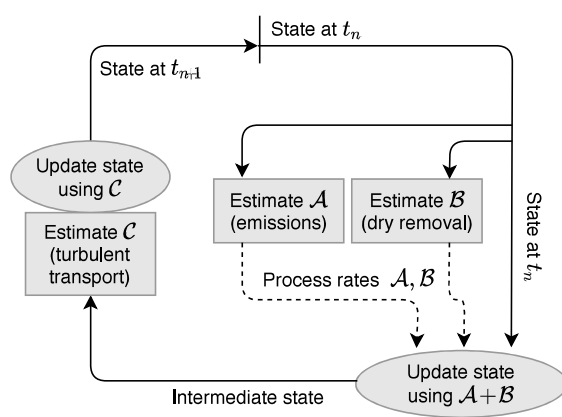
$$q_A^{n+1} \xrightarrow{\text{apply } B \text{ process for duration } \Delta t} q_B^{n+1}$$

$$q_B^{n+1} \xrightarrow{\text{apply } C \text{ process for duration } \Delta t} q_C^{n+1}$$

$$\text{Let } q^{n+1} = q_C^{n+1}$$

**(c1) Original scheme in EAMv1, ODE description**

1. Solve for  $q_A(t_{n+1})$  given  $\frac{dq_A}{dt} = A(q_A)$  with  $q_A(t_n) = q^n$ .
2. Solve for  $q_B(t_{n+1})$  given  $\frac{dq_B}{dt} = B(q_B)$  with  $q_B(t_n) = q_A^{n+1}$ .
3. Solve for  $q_C(t_{n+1})$  given  $\frac{dq_C}{dt} = C(q_C)$  with  $q_C^n = q_B^{n+1}$ .
4. Let  $q^{n+1} = q_C^{n+1}$ .

**(a2) Revised scheme, flowchart description****(b2) Revised scheme, pseudo-code description**

$$q^n \xrightarrow{\text{apply } A \text{ process for duration } \Delta t} q_A^{n+1}; \text{ let } A^* = \frac{q_A^{n+1} - q^n}{\Delta t}$$

$$q^n \xrightarrow{\text{apply } B \text{ process for duration } \Delta t} q_B^{n+1}; \text{ let } B^* = \frac{q_B^{n+1} - q^n}{\Delta t}$$

$$q^n + \Delta t(A^* + B^*) \xrightarrow{\text{apply } C \text{ process for duration } \Delta t} q_C^{n+1}$$

$$\text{Let } q^{n+1} = q_C^{n+1}$$

**(c2) Revised scheme, ODE description**

1. Solve for  $q_A(t_{n+1})$  given  $\frac{dq_A}{dt} = A(q_A)$  with  $q_A(t_n) = q^n$ .
2. Solve for  $q_B(t_{n+1})$  given  $\frac{dq_B}{dt} = B(q_B)$  with  $q_B(t_n) = q^n$ .
3. Let  $A^* = \frac{q_A(t_{n+1}) - q^n}{\Delta t}$  and  $B^* = \frac{q_B(t_{n+1}) - q^n}{\Delta t}$ .
4. Solve for  $q_C(t_{n+1})$  given  $\frac{dq_C}{dt} = C(q_C)$  with  $q_C(t_n) = q^n + \Delta t(A^* + B^*)$ .
5. Let  $q^{n+1} = q_C^{n+1}$ .