Dear Editor,

We thank you for your feedback. The question is in italics, and our response in bold text as below:

I like the extensive reply that you gave to the reviewer. I just have a small question (maybe I missed something). But if I compare the equation (24) in the reply with equation (18) in the manuscript it seems that there is a difference of a factor 2. From a quick scan it seems to me that the factor 2 in (24) is not correct. Please can you shed some light on this issue?

Equation (14) in the manuscript is the analytic solution of the unsteady state salinity distribution, represented as:

$$s = \bar{s}_0 \exp\left(\frac{Q_f a}{DA_0}\left(\exp\left(\frac{x}{a}\right)-1\right)\right)\left(1+\frac{E}{2a}\left(-\frac{Q_f a}{DA_0}\exp\left(\frac{x}{a}\right)\right)\sin(\omega t+\varphi)\right), \quad \textbf{(14)}$$

where $\bar{s}_0$ **is the tide-averaged salinity at the mouth of estuary,** ***D*** **is the longitudinal dispersion coefficient,** A_0 **is the cross-sectional area at the mouth,** ***a*** **is the convergence length of the cross-sectional area, and** ***E*** **is the tidal excursion. Since the tide-averaged salinity along the estuary can be obtained as:**

$$\bar{s}_x = \bar{s}_0 \exp\left(\frac{Q_f a}{DA_0}\left(\exp\left(\frac{x}{a}\right)-1\right)\right), \quad \textbf{(12)}$$

Equation (14) can be modified as:

$$s = \bar{s}_x\left(1+\left(-\frac{EQ_f}{2DA_0\exp(-x/a)}\right)\sin(\omega t+\varphi)\right). \quad \textbf{(S1)}$$

Introducing $A = A_0\exp(-x/a)$ **into Equation (S1) yields:**

$$s = \bar{s}_x + \bar{s}_x \times \left(-\frac{EQ_f}{2DA}\right)\sin(\omega t+\varphi) = \bar{s}_x + \bar{s}_x \times I_s \sin(\omega t+\varphi), \quad \textbf{(S2)}$$

where $I_s = -EQ_f/(2DA)$ **was defined as the salinity amplitude coefficient, i.e. Equation (24) in the reply. Therefore, the factor 2 in Equation (24) is correct.**
In addition, since the maximum salinity is reached at HWS and the minimum salinity is reached at LWS, Equation (S2) can be simplified for HWS into:

$$s_{\max} = \bar{s}_x + \bar{s}_x \times \left(-\frac{EQ_f}{2DA}\right), \quad \textbf{(S3)}$$

and for LWS into:

$$s_{\min} = \bar{s}_x + \bar{s}_x \times \frac{EQ_f}{2DA}. \quad \textbf{(S4)}$$

Thus combination of Equations (S3) and (S4) yields:

$$\frac{s_{\max} - s_{\min}}{2} = \overline{s}_x \times \left(-\frac{EQ_f}{2DA} \right). \tag{S5}$$

Rearrangement of Equation (S5) and using *x*=0 leads to the expression for the tidal excursion at the mouth, E_0:

$$E_0 = \frac{\left(s_{\max 0} - s_{\min 0} \right) DA_0}{\overline{s}_0 \left(-Q_f \right)}, \tag{S6}$$

where $s_{\max 0}$ is the maximum salinity at the estuary mouth and $s_{\min 0}$ is the minimum salinity at the estuary mouth. Since the tidal excursion is assumed to decrease exponentially along the channel:

$$E = E_0 \exp\left(-x/e \right), \tag{17}$$

we can obtain Equation (18) in the manuscript by substitution of Equation (S6) in Equation (17):

$$E = \frac{\left(s_{\max 0} - s_{\min 0} \right) DA_0}{\overline{s}_0 \left(-Q_f \right)} \exp\left(-x/e \right) = \frac{a\left(s_{\max 0} - s_{\min 0} \right)}{\overline{s}_0 \left(-\frac{aQ_f}{DA_0} \right)} \exp\left(-x/e \right). \tag{18}$$

Therefore, there is no factor 2 in Equation (18) in the manuscript.

Best regards,

Yanwen Xu, on behalf of all authors.