The manuscript presents an interesting study showing that the Van der Burgh's coefficient is spatially varying in a salt plug estuary. It is also shown that the coefficient is different in dry and wet season. As stated in the manuscript, this is the first study to Van der Burgh's coefficient in a salt plug estuary. Therefore the manuscript can in potential become an interesting paper. However, there is a serious problem with the method used in the study. The method presented is based on the salt intrusion theory for a "normal" estuary and missed an essential physical process in a salt plug estuary, i.e. evaporation. Without evaporation the inverse salinity gradient in a salt plug estuary cannot be generated. Evaporation has the effect that the residual discharge Q is no more constant along the estuary and will even turn it to be landwards directed in the part with inverse salinity gradient. In the manuscript Q is presented as constant along the estuary. This means that the results from the analysis cannot be used, especially for dry season. I would recommend the authors carrying out the analysis again after determining the spatially varying Q (residual discharge) by taking into account evaporation and precipitation.

More in detail, I cannot fully follow the presented theory after Eq.(3). Of course, this is partly due to the fact that I do not have the complete overview of the related literature. I have the following problems:

1. On line 84 just below Eq.(3), the expressions between brackets are fluxes, and not dispersion coefficients as suggested.
2. Why is S_0 instead of $S(x)$ used in Eq.(4)?
3. What is the motivation from Eq.(6) to Eq.(7)? The authors refer to their paper in (2011), but I could not find the motivation in that paper either. That there seems to be a paradox with the relation between K and υ (resulting is $K>1$) was already pointed out by Savenije (2005). Using the exponential function of υ indeed solves the paradox, but what is the rationale behind this solution?

I wonder why the authors do not just determine K directly by first determining $D(x)$ from $S(x)$.