

## ***Interactive comment on “Technical Note: Disentangling the groundwater response to Earth and atmospheric tides to improve subsurface characterisation” by Gabriel C. Rau et al.***

### **Anonymous Referee #2**

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This manuscript is an interesting one and I think it provide a more general method in calculating the barometric efficient(BE) in comparing with the provide Acworth's method. However, when reading this manuscript, I feel that there are several places that need to be made more clearly.

In Equation (7) and Equation (10), the expression of Ac is different, it is very confused. Please explain why you use different expression for Ac. What's the difference between them.

Line 187 please explain how you calculate the areial strain sensitivity.

Please provide a table to list all the parameters used in the example, and list all the

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result that obtained from your new method.

Line 207 about the negative phase shift, the phase shift is very close to 0 (-1.1°) what about the error in the phase estimation? And there are always some inconsist between theoretical calculated and measured earth tide, how can you make sure that the -1.1° phase shift is real, not caused by the different in theoretical and measured one. Also, there are several recently publications that deal with the negative phase shift, which showed that the vertical flow across the aqutiard may also cause negative phases shift, and the effect of wellbore storage or skin effect can also cause negative or positive phase shift. I suggest you provide some discussion about it. Which you may also want to make some clarlity when discuss the indication of confinement during Line 216-226.

Table 1 The unit of amplitude of ET is "m", thus many tidal components had amplitude more than 1 meter, are you sure?

Line 116-117 the authors argued that they assumed an aquitard with  $K=5.10^{-5}$  m/s, it is a rather permeabe, I think the aquitard should have a hydraulic conductivity with much small value.

Line 120 Figure ?? which Figure do you mean.....

Line 126 Equation 4.7 should be Equation 7

Line 134 Hsieh et al., 1988 should be Hsieh et al., 1987, and other places in the manuscript. "Hsieh, P. A., J. D. Bredehoeft, and J. M. Farr (1987), Determination of aquifer transmissivity from earth tide analysis, Water. Resour. Res., 23, 1824-1832."

Code and data availability, I encourage the authors to share the code and data once the manuscript has been fully accepted.

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