Author Response to the public discussion of "*Error in hydraulic head and gradient time-series measurements: a quantitative appraisal*" by Gabriel C. Rau *et al.*

Short Comments 1:

Hello: First of all, thanks for the precious recommendations for minimising the systematic errors. It's quite practical but not many people ever considered. I've three aspects to ask:

1) Change on the surface elevation: It's generally not considered for the most case, but there's a special occasion, that we recorded a surface subsidence from a 8 m GMI due to the severe drought in Thirlmere Lakes, NSW, Australia. It's been noticed because it's so visible, that without any changes on the GMI, the water level suspiciously increased for 3 days around 6 pm for 3 days. Then no more changes were monitored. Every change lasts around 1 hour with more than 100 mm increase. I think this phenomenon might associate with temperature effects or simply aquifer changes. Not sure if there's good method to mitigate?

We agree and will include the possibility of a change in reference point into our revised manuscript (together with the issue of freezing conditions raised by reviewer 1).

2) Change on the logger position from the wire connected: It's been mentioned, but not fully discussed in the main content. It mainly occurs with a vented logger and the venting cable, which has larger diameters than regular wires. Especially when the piezometer is narrow, the changes from that might be a big problem for this bore during a relatively large water recharge/pumping. That's why I personally don't recommend vented logger.

We agree and will briefly discuss the possibility that a transducer can change its vertical position in our revised manuscript.

3) As some errors might offset other errors, and we already have a brief idea for some general ranges of errors, is that possible to have an universal accepted errors for the whole records?

We agree and point out that this is an extremely complicated issue. Once multiple errors are superimposed it is likely impossible to disentangle the individual effects. Therefore, it is extremely important to understand which systematic errors can occur, so that they can be identified and eliminated as much as possible. This avoids the superposition problem, at least partially. We will mention this in our revised manuscript.

Regards, Fang