Dear Dr. Kissel,

I have been in touch with Referee B and the referee confirms that the report that was sent to you (copy appended below) is complete.

Yours sincerely,

Ansar Fayyazuddin
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Report of Referee B -- DP11626/Abbott
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This paper describes the readout of the gravitational wave strain in the Advanced LIGO detectors and assesses the systematic and statistical errors in their calibration. After giving an overview, the authors discuss the sensing system, the actuation function, and the combined response function. After having set up a formalism for treating errors and describing their primary calibration method, they arrive at error budgets for these functions. The potential impact on estimating the parameters of GW150914 is also discussed.

The paper's subject matter is crucial to the discovery and interpretation of GW150914, and its presentation is very clear. I only have very minor comments which should be easy to address, after which I will heartily recommend publication.

1. The explanation in the second and third paragraphs leading to Eq. (2) for the strain and Eq. (5) for the response function R might be formulated more clearly by going through the feedback loop in a step by step fashion and systematically introducing the set of equations describing the behavior of the system:

\[ \frac{dL_{res}}{dL_{free} - dL_{ctrl}} = d_{err} = C \frac{dL_{res}}{d_{ctrl}} = D d_{err} \]

Together with \( h = \frac{dL_{free}}{L} \), this immediately motivates Eq. (2):

\[ h = \frac{dL_{free}}{L} = \frac{(dL_{res} + dL_{ctrl})}{L} \]

Also, setting \( dL_{free} = R d_{err} \), from the above equations one can read off Eq. (5) for R in terms of A, D, C. In the current text these relations are present, but a bit scattered about.

2. In Eq. (13), the error propagation does not appear to involve correlations. Are they small, or zero?

3. Axis labels on plots in Figs. 3-10: introduce spaces between words.

4. At the end of Sec. IX: "Although potential timing offsets between different channels on the same analog-to-digital-converter board were not measured, there is no reason to believe that there were any timing offsets larger than a few microseconds." Also, "Even if the most conservative estimate is used as a measure of caution, the absolute timing discrepancy from UTC, and therefore between detectors, was no larger than 10 μs." Where do these numbers come from?