Reviewer #1 (Remarks):

This manuscript is very well written. It explains well about the aLIGO Pcal system in a clear and simple ways but with sufficient details. I suggest to publish it after minor revision. Here are some comments:

General

1. In the reference list at the end of the paper, there are many LIGO internal documents that public cannot access (Ref. 22, 23, 24, 28 and 32). They should be changed to visible for public, or use other references which can be accessed from non-LIGO readers.
   Send Jeff an email about it.

2. Also in the reference, several LIGO log entries are cited. The web address to the log top page should be noted once in the reference list.
   Link added

3. Figure 3: (photo) It is unclear what the authors want to show in the photo. Where is the periscope? Are the relay optics and camera shown in the photo? A pointer or explanation will be useful either in the photo or caption.
   (caption): In the caption should be revised; there are two relative pronouns "that," and it makes the sentence nested.

   Edit: The 1.8 m diameter aluminum periscope structure that supports the relay mirrors for the two Pcal beams as well as the large, rectangular relay optics for the beam localization camera system. In this photo, it is mounted in a cradle used to pre-align the optics before the structure is inserted into the vacuum envelope. When installed, it is supported by four flexures that were designed to maintain the orientation of the structure even as the diameter of the vacuum envelope changes between the vented and evacuated states.

4. page 5, last paragraph, the long term stability of the Pcal system can be evaluated by measuring the amplitude of the laser power modulation measured with the power sensor in the receiver module. ... A word "measured" used twice. Better wording may make the sentence clearer.

   Edit: rewrote this paragraph. Remove last two sentences because the information was redundant with info given earlier.

5. page 6, II-C and Figure 10 caption Is the mentioned millimeter accuracy enough for the system? What the target/requirement accuracy for this new camera positioning system?

6. page 12, V-C: In this subsection, The measurement and result of the coupling between the common and differential arm actuation are described. The motivation is explained as for the accurate injection tests. However, how/why 0.2% coupling is sufficient for the injection test is not explained. 0.2% sounds extremely good from the experimental point of view, but how good is it for the search pipelines and data analysis with the injected signals?