Compilation of comments from Patrick Connor,
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TYPE B

General comments:

- Even for a technical paper, the clustering of jargon is a bit thick in places, e.g. in the Readout/DAQ section. → improved when implementing comments.

Abstract:

- Suggest to change the last part of the last sentence to highlight that only local performance and calibration are described in this paper. More precisely alignment is only briefly mentioned, although not only it is an important step of the calibration of the detector, but it also contributes significantly to the local calibration by absorbing residual effects from radiation damages. (See also type-B comment in section 11.4.2.) → Obviously alignment is very important and I am sure it will play a big role in the planned performance paper. Here we only want to give a flavor of the detector performance.
If needed we can change the last sentence of the abstract to
"This paper .... of the CMS pixel detector as well as the commissioning and calibration steps which led to data taking."

2. Design of the CMS Phase-1 pixel detector

- Table 1: are the coordinates defined somewhere? → added footnote to introduce coordinate system in footnote.
- L128: instead of "unchanged", the material budget from Fig. 3 even seems "reduced", at least in FPIX. → yes, rephrased.

3. Silicon sensor modules

5. Readout architecture and data acquisition system

- L810-811: "TPLL ... LCDS": it is not clear what all these different chips are doing. If you like to avoid describing them in more detail, one way could be to point out that these were already used before the Phase-1 upgrade (if this is correct), which would make plausible that they are not addressed in more detail. → This is said on L817. Moved here to make it more clear.
- L817-818: it might be best if the legacy components and the new components would be outlined as such in Fig. 23. (could one maybe use a different colour convention on Fig.3 to distinguih the legacy and new components?) → ok, done.
- L835-837: this would be easier to understand with a sketch of the POH internal structure → prefer not to exand on this, as more details can be found in the Phase 1 pixel DAQ paper.

6. Power system

- L894-895: the phase-0 detector had 1440 modules (from LHCC-2006-001), value which was mentioned in several talks for conferences; why is it written that the number of modules in phase-1 (1856) has doubled? → → Good catch. It's the number of ROCs (or channels) that doubled. Change to "The CMS Phase-1 pixel detector comprises 1856 pixel detector modules with 16 ROCs each, almost doubling the number of ROCs with respect to the original pixel detector"

- L926: presumably the plastic has no magnetic permeability other than the vacuum, this might be pointed out since you mention that it replaces ferrite. → yes, I think it is well known that the relative permeability of plastic is 1. No change needed.

10. Detector calibration

- L1443: Why should a signal have "low amplitude", and how is it affected by "time walk"? This is not clear. → We think it is quite clear. Signals have a whole spectrum of amplitudes, starting from high ones which saturate the amplifier/adc down to the lowest amplitude which just barely crosses thresholds.
Low amplitude signals will cross the threshold later, this is the well know "time-walk" effect present in all of this type of electronic circuits.

11. Operation and performance

- L1497-1501: make it more obvious that this is still from 2017 operation → said on L 1495

- L1530: "positions" -> "positions, orientations, and surface deformations" → ok
- L1556: would be good to indicate how long a power cycle takes →
We added:
"This was achieved by switching ... channels, which took approximately 1 minute."

- Sect. 11.4.2: it should be mentioned that the alignment is absorbing residual effects from the ageing of the detector that are not covered by the procedure described here → Again, this will be discussed much more in the performance paper.
We added at the end of this subsection :
"Some residual effects caused by the radiation induced changes of the LA are absorbed by the detector alignment procedure."

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TYPE A

General comments:

- Readability would benefit from a slightly more generous use of commas and hyphens, for a better structuring of the sentences. → improved thanks to other comments
- Certain subsections could easily be split in subsubsections. → prefer to keep as is
- Usually, US spelling seems to be preferred in this paper, but we have met "labelled" (instead of "label"). → fixed

Abstract:

- instantaneous → fixed

1. Introduction

- L57: delete "up to" → ok
- L58: collisions -> operations → ok
- L60: delete "beam" (since the properties you discuss are not just those of a beam) → ok
- L68: currently expected → ok
- L69: "in view of" -> "in preparation of" → ok

2. Design of the CMS Phase-1 pixel detector

- Table 1: "r, z positions", or "radii and longitunal positions"
- L162: the pixels -> the pixel modules → no this refers to the pixels and specifies how the pixels are oriented within the module.

3. Silicon sensor modules

- L186: under-depleted sensors → rephrased.
- L190: which -> that → ok
- L197: that -> which (or remove the comma if you want to keep "that")→ ok
- Sect. 3.2: it could make sense to define subsusbection for PSI46dig and PROC600 → had this previously. Were removed because of comments during review.
- L581: "whether handling damaged module" -> probably a verb is missing in this sentence → rephrased

5. Readout architecture and data acquisition system

- L818: "the ones" -> "those" → ok
- L879: "to demonstrate" -> "which demonstrated" → ok

6. Power system

- L897: ohmic (lower case) → ok
- L963: "serve three and four pixel detector modules": was already said three lines ago. → yes, but we still need to say what the two numbers refer to.
- L993: "drop on the cables" -> "drop along the cables"? → ok, changed.

- L1023: "from 11 to 9 V, disabling was abandoned" (at least be consistent about repeating units in consecutive numbers) → ok
- L1580: "The charge loss...": does one see that in the plot (as one expects since this text appears in the discussion of the figure)? → No, the sentence does not refer to Fig 44, its just an occasion to mention the bias voltages which were used. Much more detailed discussion of charge loss will be in the performance paper.

11. Operation and performance

- L1492: comma after "Subsequently" → ok
- L1514: "full" -> "maximum"? → ok
- L1520: were encountered → ok
- L1557: "on and off" -> "off and on" ? → ok
- L1565: delete "negative" → ok
- L1567: to form clusters from neighboring pixels → ok
- L1569: the charge is distributed according to a Landau-like function. → ok
- L1592: comma after "resolution" → ok
- L1617: avoid "so-called" and quotes if you already explained this before → ok