MAIN COMMENTS

107: "They show increased expected fluence values compared to Figure 4 for some regions in the tracker."
 I think that it is unclear from the text why they do not agree also in line 110: "this study still covers the updated levels". It is unclear what is the 'baseline' and what is the 'update'. I think it would be better to define versions, and then name them. I have the feeling that the relevance of something being off with respect to previous estimates is not relevant for this paper, but if it is, then this relevance is not obvious from the text and should be clarified.

205: my ignorance: why do gain have a 10% variation? a different setup was used every time?

300: "Figure 14 shows the current-related damage rate α scaled to +21 °C of the four irradiated 2S sensors at 600 V as a function of the annealing time". The scaling is non-trivial. I would say "rescaled" and I would explicitly cite (again) with which model

322: "From the typical shape of the seed signal distribution from minimum ionizing particles (Figure 6) it can be estimated that […]"
 Actually figure 6 is a measurement with beta particles. Maybe the standard/requirement should be defined with a real MIP measurement or M.C.? Alternatively one could arbitrarily define the limit, saying it's "inspired" from the beta source measurement?

Figure 15: General question: the annealing here is applied after all of the irradiation. In reality part of the annealing will be before other parts of irradiation. This inconsitence is not mentioned anywhere in the text, and it should be somewhat addressed, even with a quick sentence.

Figure 15: "The symbols with lighter colors are from an additional sensor exposed to the same fluence"-> this is a bit confusing. If they are the same measurement, why not plotting them with the same color? If there is a difference, why not mention it?

Figure 17: "Measurement results conducted at 800 V are added in case the initially measured signal is below its specification in order to show the impact of increased bias voltage."
This is a potentially critical point. One of the objections that might be raised is that the ALiBaVa system has a 50 ns shaping time, whereas all Tracker chips haev a 25 ns shaping. This means that thicker sensors (with slower signal) are more favoured in the ALiBaVa system than in the actual one, in principle. This objection should be prevented with either of the following arguments
1) estimates of the drift time in the thick/thin sensors showing that the difference is negligible
2) direct comparison of ALiBaVa and beam test measurements

Section 7: why all considerations are on 2S modules, and similar considerations are not made on PS modules?

STYLE/TYPOS/IMPROVEMENT SUGGESTIONS:

General comment: sometimes tense appears to be wrong to me, like in 217-219 (modules were built ... sensors are arranged). Tense in the paper should reflect the time of the writing, so "sensors were arranged". Present should be used only for facts that survive the experiment: "this material gives higher signal".

4: remove "in the process of"
5: The tracking -> The new tracking
18: For the Phase-2 Outer Tracker, (add a comma)
21: Instead of saynig that only the CBC is bynary, but also the others, I would make the sentece generic and move it higher up. So after "illustrated in Figure 1", one could add the modified sentence "All Outer Tracker readout chips feature a binary readout scheme that records hits as binary 1 when the signal on the respective channel exceeds a programmable threshold."
40: at around -> around
41: sensor currents induced -> sensor current induced
42-44: "While an initial signal increase […] Phase-2 upgrade" could read something like:
   "The net effect depents on the annealing time: shorter exposures increase the signal amount, while longer ones decrease it. Therefore characterizing the annealing behavior of the signal is crucial to compare silicon sensor options for the Phase-2 upgrade.
61: As a result, ((add a comma)
65: This paper is structured as follows: section (etc, then change periods with semicolons)
76: have dimensions of -> are
80: have to -> must
Table 4: Fraction -> Neutron fraction
Table 5: I would use proper × symbols in place of x, if possible
176: "compatible with" -> "not far from" (a strict compatibility criterion is missing, so we are actually saying that they are similar)
193: "accumulated α" is unclear. I would remove "accumulated", otherwise it looks like we are talking about a different parameter.
229: data taking, (add a comma)
236: note 5: "Fraction of firing channels per triggered event" -> "Fraction of firing channels per triggered event in absence of signal"
Figure 9: I would add the electric field in the legend
268: "non-critical limit" -> "reference value"
273: when wuoting voltage, I would add also the electric field between parentheses
278: depletion, (add a comma)
280: In preparation for the beam test, (add a comma)
285: bad strips are identified-> were identified
290: "width" sounds wrong. Maybe just remove it?
Table 10: "1-2": I would use an em-dash – in place of a minus sign
299: "full-size sensors needs to be checked". It is written as if they still need to be checked.
307: values, (add a comma)
319: In order to achieve such an efficiency, (add a comma)
328: "utilized" -> "used"
338: "modules reach about" -> "modules exceed"
Figure 17: I think this is too much information on the same plot! I

mean: it is really nice that all the info fit in one plot, but then it takes too much effort to "read" it. Can we plit the particle mixture for 2s and PS into two different plots? Then they would have the respective bondaries and less "noise" around each measurement.
384: has to be -> must be
393: "This reflects": is unclear. "This threshold range corresponds"?

407: "Sensors of both materials show an efficiency above 99.5% at 800 V for tracks with normal incidence after long and short annealing periods." -> I would also add the remark that thin sensors give a higher signal than thick only for the long annealing, which is not foreseen (IIUC)
420: "large variations between measurements after normal handling" -> is this supposed to be visible from the plot?
427: "Furthermore, the average fractions of radiation and interaction lengths" -> "Furthermore, the material amount crossed by stright tracks in units of radiation and interaction length"
429: "fast simulation (tkLayout [33, 34]" -> "fast simulation (tkLayout [33, 34], considering the detector material up to the last active hit"
430: "Modules" "Moreover, modules"

Figure 22: it is unclear to me that presenting the data as function of the sensor ID adds information. Maybe a distribution would better evidence the difference between these?

445: I think that a linking sentence is missing to clarify. IIUC, I would write after "higher signals." "In this specific case, the FZ290 can still reach the target efficiency by raising the bial voltage from the nominal 600 V to 800 V."

468: TThe -> The