

Dear reviewer,

Many thanks for your constructive comments on the proceedings' paper "X-ray induced radiation damage in segmented p⁺n silicon sensors", which help to make the manuscript more clear. Below you find the replies and actions to your comments:

>>>1. Suggestion to the style: The space between the number and °C be taken out. e.g., 80 °C ->80°C

Action: Implemented.

>>>2. Pages 2-3: In the list of the topics, you quote references without providing any summary of the results (except in Plasma effect). In Summary you write for the first time "the challenging requirements can be met". It is very kind if you provide a short summary for each topic at this stage.

Action: We have added sentences which summarize previous results and indicate new results given in this paper:

After the last sentence of the subsection "Surface Damage" in Chapter 2:
Using measurements on X-ray-irradiated test structures from different vendors, we have observed that the densities of oxide-charges and interface-traps, which are responsible for the surface current, saturate at high doses. In Section 3 of this paper previous results together with new measurements are presented.

After the last sentence of the subsection "Charge losses and stability of silicon sensors" in Chapter 2:
From the studies we conclude that the effect of charge losses is small if the X-rays enter the sensor through the face opposite to the segmented read-out electrodes, as is the case for AGIPD.

After the last sentence of the subsection "Optimization of the AGIPD sensor" in Chapter 2:
A design which according to simulations meets the specifications of the AGIPD sensor for X-ray doses between 0 and 1 GGy, in particular with respect to inter-pixel capacitance, dark current and breakdown voltage, has been achieved.

>>>3. Page2: "10**4 12.4 keV photons" may be "10**4 12.4-keV photons";

Action: We have changed to: 10⁴ photons of 12.4 keV. (we do not want to put a hyphen between 12.4 and keV, as we consider 12.4 keV a number with units, where it is uncommon to put a hyphen).

>>>4. "both electron- and hole-accumulation layers with different widths have been observed"; widths are unclear. You probably use "width" where I would use "thickness". In any case, please describe "widths" not to introduce confusion.

Answer: By "width" we do not mean the "thickness" of the layer, but the lateral extension of the accumulation layer below the Si-SiO₂ interface in the region between neighbouring p+ implants. We have changed the sentence. Action: change sentence both electron- and hole accumulation layers with different widths have been observed

-> both electron- and hole-accumulation layers at the Si-SiO₂ interface with different lateral extensions have been observed

>>>4. Page4: Please add (a) and (b) in the plots shown in Fig.1. Can you confirm if pre-irradiation data points are not in the figure?

Answer: (a) and (b) have been added to the plots of figure 1. A sentence "Results of Nox and Jsrf before irradiation are plotted at a dose of 10⁻¹ kGy in the figures." has been added in the caption of the figure to specify the data before irradiation.

>>>5. References:

>>>[1] <http://www.xfel.eu/de/> . -> <http://www.xfel.eu/> . (for English readers)

Answer: Done.

>>>[3] J. Becker, Challenges for the Adaptive Gain Integrating Pixel Detecotr
->Detector

Answer: Done.

>>>[17] I could not reach "doi:10.1016/0038-1101(74)90004-5" Please check.

Answer: One can find the reference in "<http://dx.doi.org/>" with the above doi number as input.