

We revised the manuscript following the reviewers' comments. In addition, a few more minor changes were carried out. In the manuscript all changes are in red. Please see revision details below.

1 - Anonymous referee about the word 'background':

The word 'background' is used 9 times in the main text, in most cases it is used as a composite term (e.g., background current, background counts). In line 138 it says 'background characteristics' and this may well be confusing. In line 138 it now says (in brackets): *see Appendix C for details on background*. The text in Appendix C was revised accordingly (lines 149-158). In the remaining main text, the word 'background' stayed as it was.

2 - Guillaume Guérin:

l. 22 : 'accumulated damage'. I don't think accumulated damage is accurate, it should be replaced by 'absorbed dose' - done.

Additional revision items:

- Various writings of 'photo(n) peak' replaced by 'photopeak'
- Line 126: small change of wording in order to include the reference Tudyka et al 2021
- Sec 5.1 and Appendix C: the term 'non-certified reference' replaced by 'internal standard'
- Line 176 and reference list: 'Mauz et al in review' updated
- Line 254: typo corrected
- Table 4 header: I/I_0 now described correctly
- Table C1: Degering pers. com. replaced by an unpublished reference following the advice of D Degering. Consent for "Duller pers.com." was obtained from Geoff Duller during the LED conference (Sept 2021) in a social online meeting
- Fig. 3 key improved