

Line-by-line response to reviewer comment of Anonymous Referee #1

**Comment:**

*As a general comment, I would suggest to shorten the paper and move some technical part and reference to the python code in the Appendix.*

*For instance I would suggest to move Section 4 into an Appendix F.*

*I would also suggest to shorten Section 5 and focus on the geophysics only in this Section, since it is the main target of the paper. Section 5.1 may either be included into Section 2.2 in a shorter form, or move to the Appendix as well.*

**Response:**

We followed the suggestion of the reviewer and put sections 4 and 5.1 into the appendix, such that in the main text there should be a focus on mainly the Geophysics.

**Comment:**

*A Figure to explicit the different variables in Section 2.1 would be nice.*

**Response:**

We included a table showing all use variables in the main text

**Comment:**

*On the formal aspect, there are 2 conventions for the authors citations. Either : (Author et al, date) or : Author et al (date). Please unify.*

**Response:**

We checked all citations and made sure that they obey the style guideline of the journal where the "Author et al. (date)" format was used when the author is explicitly part of the sentence and the "(Author et al., date)"-style when the authors were not part of the sentence. We thereby also revised a few typos with the brackets.

**Comment:**

*l. 55 -> suppress "we aimed at".*

**Response:**

The second "we aimed at" has been eliminated

**Comment:**

*l. 220 -> "In order to..." -> incomplete sentence*

**Response:**

The sentence has been completed to:

"In order to speed up the computations – especially the calculation of the pair production cross-section, which includes two nested integrations – we utilise customised energy loss tables."

**Comment:**

*l. 404 -> "MCMC" not defined before*

**Response:**

Changed "MCMC" to Monte Carlo. In this way the term "MCMC" enters only when the Metropolis-Hastings algorithm is described.

**Comment:**

*l. 474 -> "Algorithm 1" -> there is no 2*

**Response:**

We omitted the 1.