General review comments by Andrew Millard

This paper gives an overall description of the BayLum package which runs in the R statistical computing environment. In general it is clear and only minor changes are needed for publication.

We thank the referee for this positive feedback.

The paper gives a thorough description of the models developed which form a holistic approach to the uncertainties in OSL dating, though it is yet to be seen how well the input routines will adapt to the slightly differing approaches of different laboratories.

We agree with the referee on this issue of laboratory specificities, assumptions and approaches. We would like to take this opportunity to tell interested readers that we would be happy to help adapt the routines to particular cases that we have not considered here.

The error terms for the various measurements and constants that contribute to the calculation of an OSL date are comprehensively considered and each is handled in an appropriate fashion.

Thank you!

Specific and technical comments

I have only one correction that needs to be made. The authors often use the frequentist term confidence interval or its abbreviation CI when they should be using the Bayesian term credible interval. The only place that confidence interval is appropriate is in referring to the Gelman-Rubin statistic. Elsewhere it is not appropriate, for example, Line 195, Figure 1, and in Table 1 the caption says credible intervals (correct) but the header row uses confidence intervals (wrong).

Agreed.

I have run all the code provided in the R markdown file, and confirm that it produces the expected results, except at two points: In the RMd file the scatterplots generated at lines 254 and 260 in Example 2 do not appear to be truncated as in Figures 4 and 5. I think this is because they use A$Sampling rather than A1$Sampling.

Thanks a lot for such a thorough review! Well spotted, we have corrected the Rmd file accordingly.

Fer 2 has 95% credible interval of 36-46 ka (manuscript line 526) but the markdown output (from line 423) gives 31-39 ka.

This is because we have not provided, together with the Rmd file, the BIN-files containing all grains analysed in the paper, as we wrote p. 4, l. 156-157: 'Each folder contains one BIN/BINX-file (i.e. OSL measurements; note that only a small fraction of the measured grains is included here in Supplementary Material)'. In the Rmd-file, l. 85 we also wrote 'Please note that the example datasets have been considerably shortened and do not include the full dataset of the samples FER1 and FER3'.