Answers to comments by Anonymous Referee #3

We thank the reviewer for his/her comments on our manuscript.

The point-by-point replies to the comments are provided below:

<u>Minor comments:</u>

<u>Comment #1:</u> *l. 5 I suggest replacing 'therefore' with 'consequently' to avoid a repetition with the previous sentence*

<u>Answer:</u> Ok

<u>Changes in manuscript:</u> changed as suggested

<u>Comment #2:</u> *l. 22 should be 'Integrated Forecast System'*

<u>Answer:</u> Yes, that's an error.

<u>Changes in manuscript:</u> corrected

<u>Comment #3:</u> *l. 41 I believe you want ECMWF here*

<u>Answer:</u> Yes

<u>Changes in manuscript:</u> corrected

<u>Comment #4:</u> *l. 58 should read '1990s'*

<u>Answer:</u> Ok

<u>Changes in manuscript:</u> changed as suggested

<u>Comment #5:</u> *l. 62 You probably want 'intersect' and not 'interSect.'*

<u>Answer:</u> Yes

<u>Changes in manuscript:</u> corrected

<u>Comment #6:</u> *l. 99 Should read US National Centers*

Answer: Ok

Changes in manuscript: corected

Comment #7: *l. 107/108 – the two reference should be in brackets*

Answer: Agreed.

Changes in manuscript: corrected

Comment #8: *l. 116 reference should be in brackets*

Answer: Agreed

Changes in manuscript: corrected

Comment #9: *l. 146 reference should be in brackets*

Answer: Agreed

Changes in manuscript: corrected

Comment #10: *l. 155 suggest skipping 'it' or better replacing it with 'the'*

Answer: Ok

Changes in manuscript: We rephrased the sentence. (See comment # 11 of Anonymous Referee #2)

Comment #11: *l. 169 'implied; instead of 'inplied', I believe*

Answer: Yes

Changes in manuscript: corrected

Comment #12: *l. 181 missing 'n' in 'ecessary'*

Answer: Ok

Changes in manuscript: corrected

Comment #13: *l. 184 - 187 and then also l. 206 – 209: are 'access mode' and 'application mode' two different things? Are 'ECMWF Member States Linux servers', 'Member State Gateway server' and 'local host' rather access modes than application modes? And based on those three access modes, four application modes are derived? Maybe it is then clearer in conjunction with the header*

of section 3.1, where 'Remote', 'Gateway' and 'Local' are referred to as application modes. And then in conjunction with user mode it results in four user application modes.

Answer: This comment is somehow related to Anonymous Referee #1's comment 18. Yes, access modes and application modes are different. However, in this context the term "access mode" is better replaced by "user group" and the "application mode" in this first sentence should be replaced by the "location of execution". The description was not clear and we renamed the respective terms.

Changes in manuscript: *The actions executed by flex_extract (also called "the software'" henceforth) depend on the user group (see Sect. 2.1), the location of execution, and the data to be retrieved. There are three possible execution locations, namely the ECMWF Member State Linux servers, the Member State Gateway server, or a local host.*

Comment #14: *l. 187 results*

Answer: Ok

Changes in manuscript: changed as suggested

Comment #15: *l. 227 – depends which spelling you follow; if it is BE then 'licence'; but I noticed indeed that Copernicus Publications follow AmE spelling of this word, namely 'license'*

Answer: Yes. We use British English. Only in the case of the filename LICENSE.md AE is used following the dominant usage in the software community. In any case, the Copernicus editors will have the final word.

Changes in manuscript: no changes.

Comment #16: *l. 240 – I may be missing something important in the software structure but I do not understand why sending a script to the ECMWF batch queue in step 1 contrasts in steps to and 3; in particular do not understand 'or' here; I would imagine that that job sent to the batch queue also retrieves data from MARS and post-processes them to obtain FLEXPART input fields. From l. 249-252 I understand that flex_extract proceeds with steps 2 and 3 locally; is it correct? It is a small thing but it would be good to clarify*

Answer: Flex_extract sends a korn shell script as job script to the batch queue and when this script will be started from the queue eventually, it starts flex_extract again to finally retrieve (task2) and post-process (task3) the data on ECMWF servers. Other Reviewers had the same problems in understanding this logic and we therefore rephrased it. Please see comments #22, #24, #25 and #26 from Anonymous Reviewer 1 for our answer.

Changes in manuscript: Please see comments #22, #24, #25 and #26 from Anonymous Reviewer 1 for the changes.

Comment #17: *l. 268 – you want to use 'which' once*

Answer: Yes

corrected

Comment #18: *l. 283 – should read 'for a correct setting'*

Answer: Ok

Changes in manuscript: changed as suggested

Comment #19: *l. 284/285 – you probably want to use the word 'combination' only once*

Answer: Yes

Changes in manuscript: corrected

Comment #20: *l. 355/356 – these papers should be referenced in brackets*

Answer: Yes

Changes in manuscript: corrected

Comment #21: *l. 363 – does it stem from private communication with Paul James?*

Answer: This comment is in line with Anonymous Referee #1's comment #30. Please see there for our answer.

Changes in manuscript: Please, see comment #30 of Anonymous Referee #1 for the applied changes.

Comment #22: *l. 373/374 – what is the position of 1 and 2 with respect to a,b,c,d*

Answer: This would be 'b' and 'c' respectively. Nevertheless, we rephrased the sentence for clarification.

Changes in manuscript: *... which is output at the central point of the four adjacent time intervals:*

Comment #23: *l. 416 should read 'pressure'*

Answer: Yes

Changes in manuscript: corrected

Comment #24: *l. 504 – what is a pure forecast? Do you mean deterministic forecast? 'Pure forecast' also later appears in l.527*

Answer: In our context, a pure forecast means that we extract only forecast fields and the retrieval period is longer than one day without analysis fields in between. We added this information in Sect. 3.9.2. and added a reference to this section from the first appearance in 3.8.5. We also changed the naming in "long forecast".

Changes in manuscript: *For a long forecast, where only forecast fields are retrieved for more than 23 hours,…*

Comment #25: *l. 513/514 – not sure what this sentence mean? Is there just 'is' missing in this sentence? Or is there more to add?*

Answer: There is just an 'is' missing.

Changes in manuscript: corrected.

Comment #26: *l. 524 - is YYMMDDHH in this file name the analysis hour?*

Answer: No, it is the valid time.

Changes in manuscript: *There is one file per time step and YYMMDDHH indicate the date and hour for which the fields are contained in the file.*

Comment #27: *l. 529 would 'base time' be better than 'starting forecast time'*

Answer: We added the term 'base time' since ECMWF uses it.

Changes in manuscript: *The HH represents the starting time (base time) of the forecast.*

Comment #28: *l. 535 – I may be missing something here but why the file names selected for the ensemble members do not account for FORECAST_STEP?*

Answer: If we retrieve a combination of ensemble members and pure forecast, the naming scheme would be a combination of Sect. 3.9.2 and 2.9.3.

Changes in manuscript: no changes

Comment #29: *l. 548 – should read 'makes'*

Answer: OK

Changes in manuscript: corrected

Comment #30: *l. 581 – I would skip the coma after e.g.*

Answer: OK

Changes in manuscript: changed as suggested

Comment #31: *l. 615 – do you mean 'paths'?*

Answer: Yes.

Changes in manuscript: corrected

Comment #32: *l. 624 – should read 'except'*

Answer: Yes

Changes in manuscript: corrected

Comment #33: *l. 687 – better 'indicates a lower complexity'*

Answer: Ok

Changes in manuscript: changed as suggested

Comment #34: *l. 720 'Lagrangian' should be one word*

Answer: Yes

Changes in manuscript: corrected

Comment #35: *l. 721 – 1990s*

Answer: Ok

Changes in manuscript: corrected

Comment #36: *l. 940 – skip 'an'*

Answer: Ok

Changes in manuscript: corrected

Comment #37: *l. 942 and 943 are too tightly formatted in vertical (also true for l. 848 and 849 and l. 888 and 889 then for lines 966, 967 and 968; subsequently lines 982, 983 and 984 have different vertical formatting than the rest of the manuscript; l. 1062 and 1063 are too close in vertical as well)*

Answer: Yes, we noticed that this comes from the scriptsize environment where we missed to introduce a new paragraph before the following section.

Changes in manuscript: corrected

Comment #38: *l. 954 you may want to insert a blank space after the bracket*

Answer: Ok

Changes in manuscript: changed as suggested

Comment #39: *In the caption of Tab.2 'resolution' instead of 'resoltion'*

Answer: Ok

Changes in manuscript: corrected

Comment #40: *In the body of Tab.6 – should be 'Public users have to register for obtaining an account'*

Answer: Ok

Changes in manuscript: corrected

Comment #41: *In the caption of Tab. 18 you need to insert a blank space after etadot*

Answer: OK

Changes in manuscript: corrected

Comment #42: *In the caption of Tab. 24 it is difficult to understand the first sentence starting from: 'Python code'; could you, please, re-phrase. I would also suggest putting sections v7.0.4 and v7.1 of this table side by side and not one on top of the other, if possible (I am aware there is no strict correspondence between theses two sections)*

Answer: We agree to rephrasing the first sentence. But, putting the two versions next to each other does not make sense since the names of the classes and methods are not the same and do not correspond to each other. We think it would be misleading for the reader. Anyway, since we shortened the manuscript, this table is now moved to the supplement.

Changes in manuscript: *Python code blocks and their cyclomatic complexity (CC) which ranks between C and F and their corresponding CC score.*