I provide two Julia files (SISAL2_read.jl, U-ThAgeCalc_function.jl). The first one is doing some quality check on the provided U-Th data. I tested this task as thorough as possible. But small bucks could still be there.

However, as it is now, the output appears perfect to me. If you find errors I am happy, to solve them together with you.

Description/comments on the SISAL2_read.jl:

1. Decay constants (l 18 - 38)

2. Reading data files (l 39 - 75)

   - I read all SISALv2 data files, but this is of course not necessary

3. Filter all stalagmites, dated by U-Th (l 76 - 104)

   - throw away the rest;
   - find according stalagmite names and cave sites (including their ids)

4. Find output for SISAL for improving the 'dating data sheet' issue (l 105 - 322)

   - datasets_metadata_issues_approval check.csv (l 309: gives you an idea about which values are missing for each stalagmite)
   - dating_datasets.csv (l 322)

5. Real quality check of provided dating data (l 325) – this will be crucial for a quality control to be implemented in SISAL

   a) Checking which of the provided U-Th data are available (l 329 - 355)

   b) According to the set of provided data, prepare those data in a way that (uncorrected) age calculations are possible (l 356 - 452); flag those sample_ids, where no age can be calculated otherwise calculate ages

   The following table provides an overview, with which set of data it is possible to calculate uncorrected ages.

#	238U	232Th	230Th	230Th232Th	230Th238U	234U/238U
1					x	x
2	x		x			x
4	x	x		x		x

c) as in b), this time for (detritus) corrected ages (l 453 - 619)

The following table provides an overview, with which set of data it is possible to calculate detritus corrected ages.

#	238U	232Th	230Th	230Th232Th	230Th238U	234U/238U	ini230Th232Th
1	x	x			x	x	x
2	x	x	x			x	x
3				x	x	x	x
4	x	x		x		x	x
5		x	x		x	x	x

d) Evaluating individual data for correctness (as far as possible, e.g., check if d234U provided instead of activity 234U/238U). If there everything appears to be correct, compare calculated uncorrected ages with those given in 'dating.csv'. If those do not agree, most likely some strange things happened and the raw data are not correct. (l 620 - 664)

e) as in d) but for detritus corrected data (l 665 - 719)

Attention: No warning is given, if the errors of U-Th data are not provided. As from scanning the literature during helping to correct the SISAL dating data sheet, quite often errors of individual values are not given in the paper. So I think it makes no sense to check these as well, as they are simply not available. If they are available, they would have been implemented (that is at least as I think of this.)

I also provide a second Julia-file (U-ThAgeCalc_function.jl), where I stored the functions for the data preparation for age calculation (prepare1, prepare2) and the functions for the age calculations and their errors (age_determination, age_err_determination, detritus_corr, detritus_corr_err).

If there are questions, please do not hesitate to contact me (jens.fohlmeister@pik-potsdam.de).