What's new in TSG8, 2 June 2020
TSG build 8.0.7.1 (and 8.0.7.4 update)

Hello fellow insiders.   TSG build 8.0.7.1 has an updated spectral library for TIR unmixing.   There's also a new splash screen to cheer you up.   Then, some of you will be pleased to know that the Chinese core-logger import has been updated to produce datasets that are starting to look like HyLogger ones.   Aside from that there's the usual collection of smaller additions and fixes, and at the end is a short section about the fixes and changes in the small update release 8.0.7.4.   See the log for further details.

Important: TSG build 8.0.7.1 bumps the TSG dataset version.   This means that an older TSG will not be able to open any dataset that this release has created or modified.

TIR unmixing library update

The updated library is known to us as 'MS9'. Inside TSG, unmixing results calculated from it are reported as **version 7.08**.

The following spectra were **dropped** from the previous library (MS8.2a, version 7.07):

- Kaolinite-PX   A troublesome spectrum.   No replacements yet.
- Andalusite   Two new ones measured.
- Kyanites (2 spectra)   New ones measured.
- Enstatite   New ones measured.
- Muscovite [double]   New ones measured.
- Biotite   New ones measured.
- Alunite-K   New ones measured.

The following spectra were **added**. There are pyroxenes, sulphates, aluminosilicates, micas and a couple of others. Note that blacklisted spectra are shown with a dark grey background in TSG's selection lists. They are not included in unmixing unless you select them yourself. Many of the other new spectra are not selected by default either, but the blacklisted ones have this extra visual cue.

Mineral	Sample number	Reason if blacklisted
Aegirine	mes085	
Aegirine	mes053	
Alunite-K	mes009	
Alunite-K	mes0983	
Alunite-K	mes008	
Andalusite	m2168	
Andalusite	m1405	
Augite	mt8280	
Augite	m1865	
Augite	m2222	
Biotite	mt8288	Other like it, and big 6500 feature
Biotite	m1592	
Biotite	m1589	
Diopside	diopside_196	
Diopside	m1109	
Diopside	46e654	
Enstatite	m2469	
Enstatite	mes041	
Hedenbergite	m2151	
Hedenbergite	nr139	6500nm feature
Jadeite	143_jadeite	
Jarosite	m1234	
Kosmochlor	mes081	

Kyanite	mt8362	TSA temp correction -52°
Kyanite	m1352	
Kyanite	m2240	
Marialite	scapolite_67	Far too easily matched
Marialite	ms81	Not an official sample
Meionite	m1402	
Microcline	Oak dam	Not an official sample
Muscovite	m2427	
Muscovite	Erwan3	Other like it
Muscovite	m1584	Other like it, and weird MIR shape
Muscovite	m2188	Other like it
Muscovite	m1583	
Omphacite	mes082	
Petalite	m2842	
Petalite	m2823	
Pigeonite	mt8397	
Phlogopite	m1591	Other like it, and 6500
Phlogopite	mes014	Too plain
Phlogopite	m1594	
Phlogopite	mes004	
Retsgersite	gdd001	
Rhodonite	m1094	
Rhodonite	broken_hill_rhodonite	6500nm feature
Sillimanite	nr28	
Sillimanite	m1391	
Spodumene	mes079	
Spodumene	m1095	
Spodumene	m2408	A slightly weaker version of M1095
Spodumene	m2082	
Wollastonite	mt8432	
Wollastonite	m2086	

# Locking TIR unmixing results in old datasets

A change to the unmixing library usually causes a change to unmixing results.

If you have an old dataset with version 7.07 TIR unmixing results and would like to prevent these results from being recalculated, you can lock the results.   (e.g., You might have written a report on the dataset.)

Go into File -> Settings [TSA] and click the button: **Configure TSA and CLS result lock-down**.   Lock down the items that you would like to preserve.
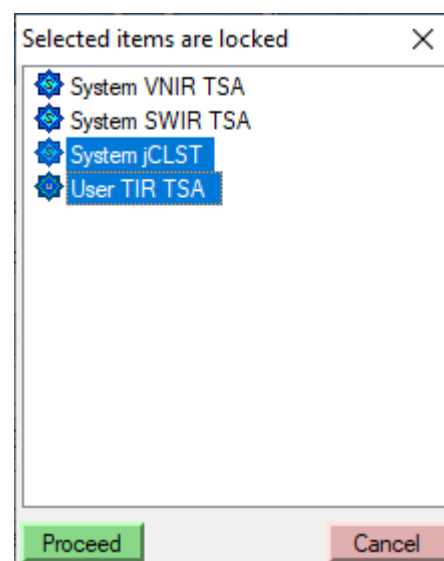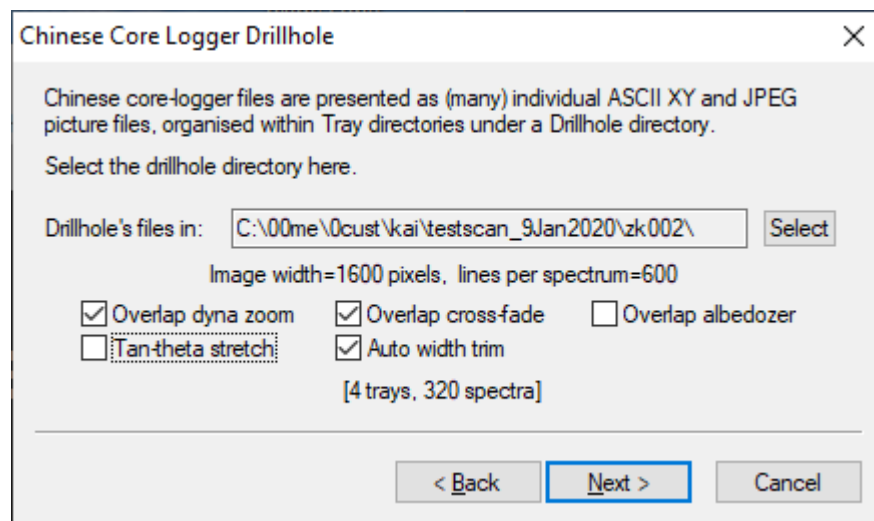
New splashscreen
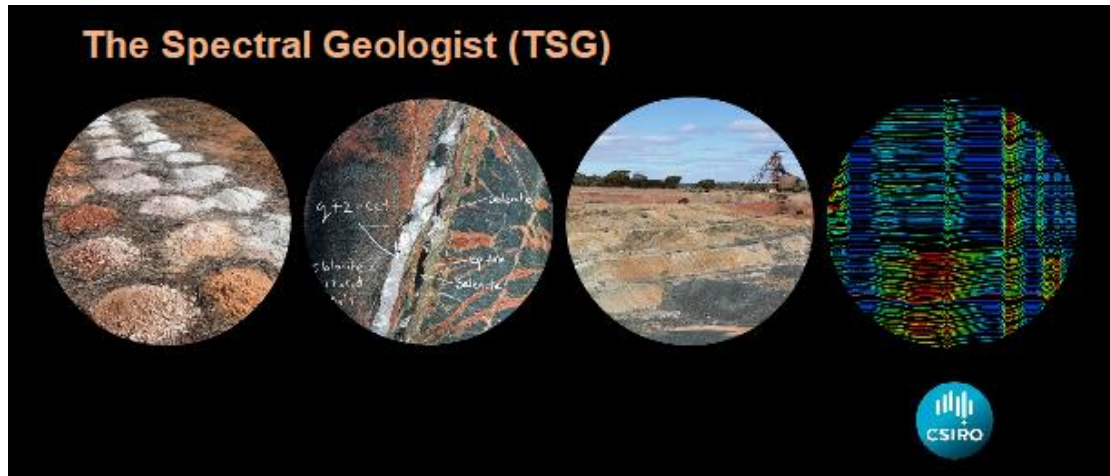
The moon is gone!
Thanks to Jon Huntington for the design, and Luke Macmillan for two of the pictures.

Chinese core-logger import

Given new metadata files, this import can now deliver core-tray reconstructions similar to the HyLogger SDF import's.

The import dialog has five image-processing options like the SDF import's.

- Dyna-zoom allows each image frame to be magnified or reduced slightly to improve the overlap correlation.
- Cross-fade conceals overlaps by cross-fading over the overlap region.
- 'Albedozer' is similar to the cross-fade option but only works on albedo (brightness), not the full imagery.
- Tan-theta stretch standardises the pixel size across-scan. This option probably isn't necessary but it's there if you'd like to try it.
- Auto width trim discards excess imagery. (The camera records far more than required across scan.) Bear in mind, however, that imagery can also be trimmed after the import. (File -> Special -> Linescan width trimming and resampling.)

Other new functionality and fixes

Imports

HyLogging SDS

A new diagnostic check has been introduced for the SWIR and TIR FTIR spectrometers. The 'inspiration' came from an intermittent SWIR noise problem with the NTGS HyLogger-3. The problem can be detected by a noise estimate derived over a tray's dark calibration, suitably thresholded. A threshold was found for the SWIR spectrometer and set as the default. No similar noise issues have been reported for the TIR spectrometer at this time but the same mechanism was put in place for it (with a 'safe' default threshold that shouldn't trigger).

Settings can be adjusted in the Diag sub-dialog that is brought up from the HyLogging Diag Mode dialog. If the check's Critical checkbox is on then the import will stop (with an error message) if a noise problem is detected for a tray. Otherwise (Critical off) the **HyLogDiag** scalar will contain **ZS** diag codes (or **ZT** for thermal) for noisy trays.

Dark noise, SWIR: 4.0e-05   TIR: 1.0e-04   ☑ Critical

ASCII XY spectral import

Spectral Evolution oreXpress .SED

This import can now handle .sed files where the wavelength column isn't the first one.

Agilent .ASP

Each sample's date is taken from the oldest timestamp (usually the last-modified time) of the sample's .asp file. There was a time-zone bug in TSG's handling but it has now been fixed.

General

I would also like to remind you of quite an old option that can be useful in ASCII imports. In File -> Settings [System] there is an option called **Euro-style CSV handling**. Normally the comma is used as a delimiter in a CSV file, but in Europe the semi-colon is commonly used instead, and the comma is used as the decimal 'point' in numbers. As you can imagine, if TSG handles things incorrectly then it's a bad thing.

Now the reason I'm mentioning this here is because it looks like some instrument manufacturers are starting to use this Euro style in their spectrum files if the customer's computer has a certain system setting. I have seen this in **oreXpress** and **Agilent** files. Wrong handling of oreXpress files results in a straight-out failure. On the other hand, Agilent files *seem* to work but there's a mysterious and troubling loss of precision in the spectra.

So if you have problems with ASCII imports, check the files for Euro-style delimiters and turn on TSG's system setting if necessary.   (The system setting also works for ASCII XY spectral imports.)

Binary ASD

A list of failed files is generated to a file called **00FAILEDIMPORTFILES.txt**.   Each line includes a failed file's filename and a brief description of the problem.
Some analysts import thousands of .ASD files in one go, and until now TSG would only report the number of failed files at the end of the import.   Analysts would be left searching for the failed files and wondering why they failed.
The most common cause of failure I've seen so far is 'Different to the other files in this collection: **datatype**'.   I've seen this in collections of reflectance spectra that included a handful of DN spectra (an instrument handling issue).

ENVI

The '**.raw**' data-file extension is used for SpecIM files sometimes, and TSG wasn't recognising it.   It's recognised now.

Picture import for field datasets

The dialog's **Dup** (duplicate picture) function only worked up to a point.   Also, imported GPS scalars were not being finalised and were not saved persistently.   These bugs have been fixed.

Assay CSV import (scalars)

The handling of embedded quotes has received some attention.
For example, say the assay table has a comment column and one of the comments is: `This item includes "embedded" quotes`.   When exported from Excel to the clipboard it looks unchanged, but when exported to a csv *file* it looks like: `"This item includes ""embedded"" quotes"`.   TSG should now handle both cases but **the file route is recommended**.

General, spectral resampling

The **Plain L3** algorithm has been tweaked slightly.   Also, the **Bandpass** method's gaussian 'footprint' has been widened and should deliver slightly better results from very sparse input channels (e.g., at the long end of the wavelength range of an FTIR spectrometer).

Scatter screen

There's a new option called **Copy current sub**.   You'll find it in the right-click menu just below the Move current sub option.   It brings up the same sub-dialog as the Move current sub option, but instead of swapping the two subscreens' places it *nukes* the target subscreen.   The target subscreen becomes a carbon copy of the current one.

It's handy for when you want to set up a series of subscreens that are mostly alike exept for say the aux colour scalar.   You can make copies and then do the necessary adjustments.

The rest

Summary screen, spatial plot

Sample tracking could come unstuck if the X scalar (normally Depth) was not in sort order, and could even cause a crash when combined with a linked spectrum-mode floater.   The issue has been fixed.   Also, the bin-size logic was reworked to be more accommodating to small datasets, when the **Index** scalar is used for X.

External unmixing

CLS algorithm

Group names were wrong (but okay for the TSA algorithm).
Some recalc invocations (e.g., the Domain editors Recalc button) didn't update the CLS class tables and this could lead to jumbled results under the 'right' circumstances.

TSA algorithm

User TSA algorithm settings are now used for external TSA unmixing.   So if you would like to adjust the aspectral threshold (say) for external TSA then make your adjustment via File -> Settings [TSA], for the corresponding library (e.g., the SWIR library for an external SWIR-compatible library).   *Important*: This must be done before attaching the external library.   If the library is already attached then detach and re-attach after changing settings, or close and re-open the dataset after changing settings.

Mid infrared (MIR)

I hesitate to mention that TSG now includes very early support for MIR unmixing with an external library.   It still has a long way to go before it can be called even half reliable, however.

Sorted datasets

Here I mean datasets that have been sorted on one or two scalars using the Log screen's sorting options.

Domain editor

Domain editing is not allowed on sorted datasets but there used to be a couple of back doors.   Checking has now been tightened up.

Tray screen

The Tray screen has always presented as if the dataset were unsorted, but navigating it from a Floater was a journey into the unknown. This has now been fixed. The interplay between the Tray screen and a Floater works as if the dataset were unsorted.

Floater scratchpad

There was a bug in sample deletion that could result in scrambled sample names. It has been fixed.

Samples may be reordered in Spectrum and Stack plot modes. The Floater's previous and next buttons (◀ ▶) are enabled for these modes. You can use the buttons to move the currently-selected sample up or down in the list. This reordering is persistent.

The selection list has received some attention. It now includes checkboxes. In the Overlay plot mode, you can retain the list-item colours by clicking in the space below the list items after making your selection. You can then see the list-item colours relating to the plot colours.

Rockmarks scalar

Every TSG dataset gets a Rockmarks scalar now, not just HyLogging datasets. You will find it in the Locations scalar folder.
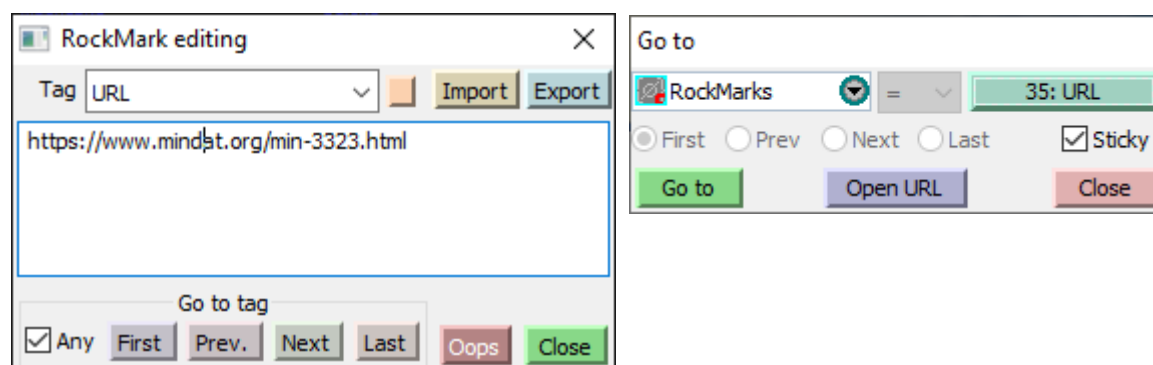
The **Rockmarks editor** (Log and Tray screens) offers a new tag type: **URL**. You should enter the actual URL itself in the Comment area.

To complement this, the **Goto dialog** (➡ toolbar button) has an **Open URL** button that will direct your web browser to a mark's URL.

Copy processing

CLS scalars have always been 'scalars non grata' to Copy Processing due to the complexity that would need to be dealt with. But perhaps Copy Processing took things a little too far up until now. CLS scalars were *utterly* banished – even other scalars based on them (e.g., class-extraction scalars) were banished too.

This has been eased up a little. If the target dataset also has CLS scalars with the same names as the template's, and based on the same system library as the

template's, then the template's scalars are treated as 'matched import' scalars. This means that other scalars based on the CLS scalars can be copy-processed.

Class editors

There is a new hotkey: **<ALT><SPACEBAR>**
It assigns the current selection to the class item that's currently selected in the list.

- Log- and Tray-screen class editors must be in Select mode. If there is a current selection then it is assigned, otherwise the current sample is assigned.
- In the Scatter screen, if the editor is in Lasso mode then any lassoed samples are assigned. If in Class-locked mode, the current sample is assigned. Nothing happens in Lookup mode.
- The Stack-screen editor only works with masks. Here, the hotkey toggles the current sample's mask state.

Tray pictures

The handling of **View -> Plot format tweaks** in tray-picture generation has been given a good working over. You should now have good control over the size of the main title, X-axis title and X-axis annotation. Also, the handling of the top-left and top-right icons has been tweaked. Icons are now magnified as necessary for high-resolution pictures.

Mouse zoom

This is the graphics tool with the ⬚ toolbar button. It lets you stretch out a rectangle in a plot, and TSG then zooms in to the rectangle.
It has been tweaked slightly. If you don't stretch out a rectangle at all (e.g., you just double-click) then the plot gets reset to its full range.

Headless TSG / download service

TSG can generate two kinds of log files.

1. When given the **/DEBUG** command-line switch, TSG generates a numbered log file called tsgeol8_xxx.log alongside the TSG executable. (Right-click your TSG desktop icon and select Properties to find out where the executable is.) Occasionally I request a user to generate this file and send it to me to diagnose TSG startup problems.
2. When running in headless mode, TSG generates a numbered log file alongside the headless script; named after the script file.

Now, if you run headless TSG with a script *and* use the **/DEBUG** command-line option, you will get the log file as in option 2 but it will also include diagnostic startup entries.

TSG8.0.7.4 Update

As sometimes happens, some issues were discovered after the formal release so it is followed by a small update, and taking advantage of the occasion a couple of minor enhancements are included.

Fixes

- Headless mode: A recent change to combined script / diagnostic log handling spoiled the normal use of headless scripts.
- Updating older datasets: Automatically updating unmixing results in the associated dataset on dataset open could crash TSG under certain conditions. (This was not a new bug; it had just gone unnoticed for some time.)
- Windows XP build (for TSG QC on HyLoggers):   The latest WinXP build of TSG required a DLL that XP doesn't include.   A workaround was found.
- Floater previous / next navigation: This was spoiled for the scatter screen, by recent work.
- Scalars-only datasets: The import wasn't putting the scalars in the usual folders.   The Scatter screen wasn't working.   Log-screen sorting wasn't working.   (These are not new bugs but they went unnoticed for some time.)

New functionality / enhancements

- Database upload: The warning about missing tray pictures has been improved.   The number of missing pictures is now reported.
- Headless mode, CLIMPORT task: A new option has been added to import each SDS file-set to its own 'tsgtray' dataset.   (These single-tray datasets are normally generated by TSG QC on a HyLogger.)   The operation can work through nested subdirectories.
- Keyboard accelerators: <ALT>C was added – copy to clipboard.

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