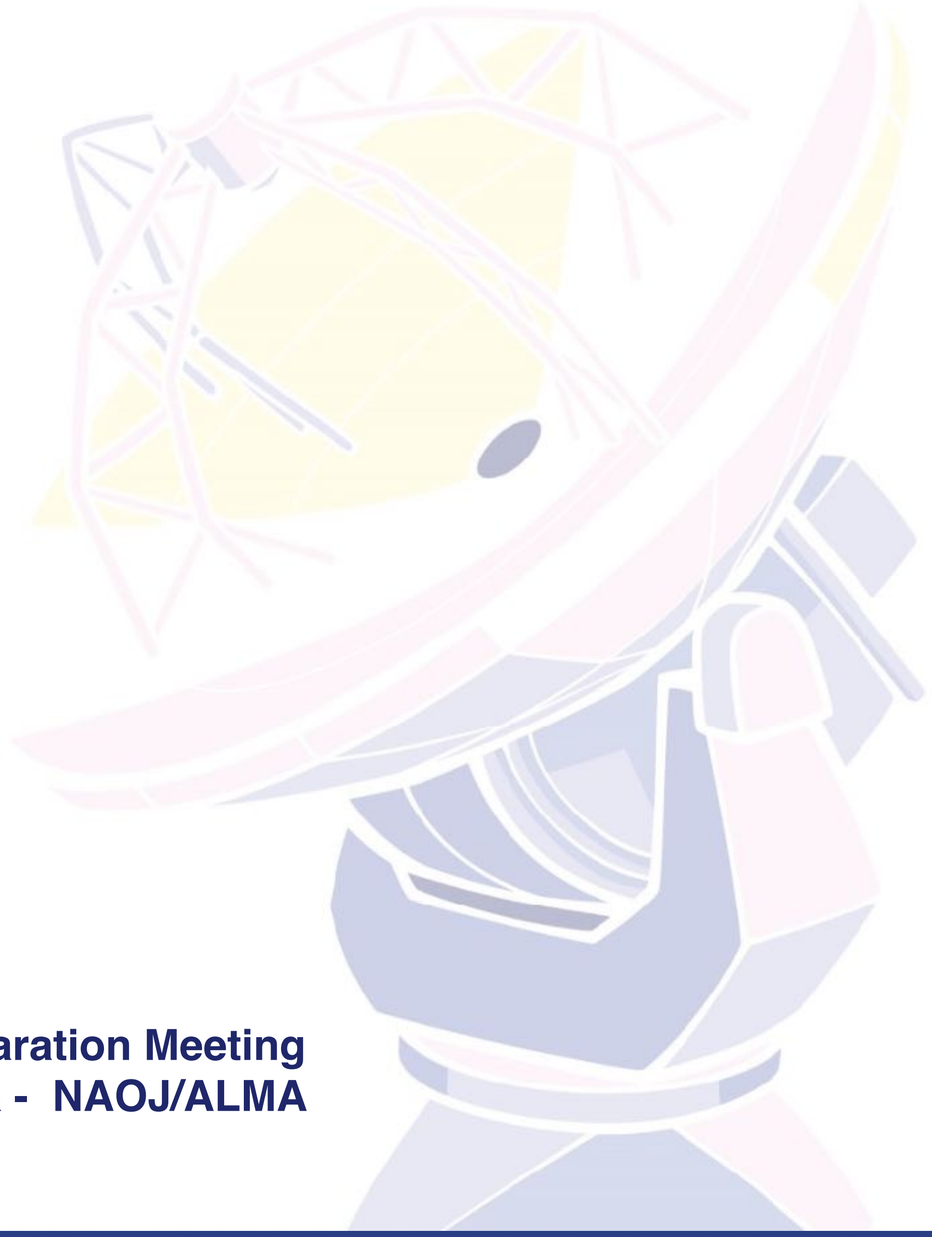
Observing Tool

Quick guide and new in Cycle 9, 2022



ALMA Cycle 9 Proposal Preparation Meeting
Jorge A. Zavala - NAOJ/ALMA

- Note that in order to submit proposals you will have to **register** with the ALMA Science Portal beforehand

- Proposers **must** use the appropriate version of the OT for the cycle 9

https://almascience.nao.ac.jp/proposing/observing-tool

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- Solar Ephemeris

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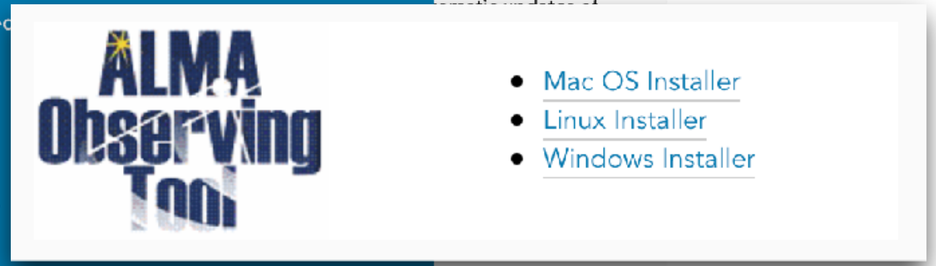
Download & Installation

The OT should run on all common operating systems and depends on a version of Java being available. I... that a suitable version of Java was installed, but the Cycle 9 version of the OT will come with its own version of Java 11 ... Unfortunately, as Java 11 does not include Web Start, this version of the OT is no longer available. The Cycle 9 OT can be ... h a tarball distribution.

It is recommended that the OT be installed using the ALMA **OT Installer**. This uses a modern graphical in... nge various settings from their defaults, including the amount of memory the OT may use. The installation will produce an exe... ... the tool are no longer possible, but the OT will detect if an update is available at start-up and inform the ...

The **tarball** version must be installed manually and the instructions for doing this have not changed.

Installer



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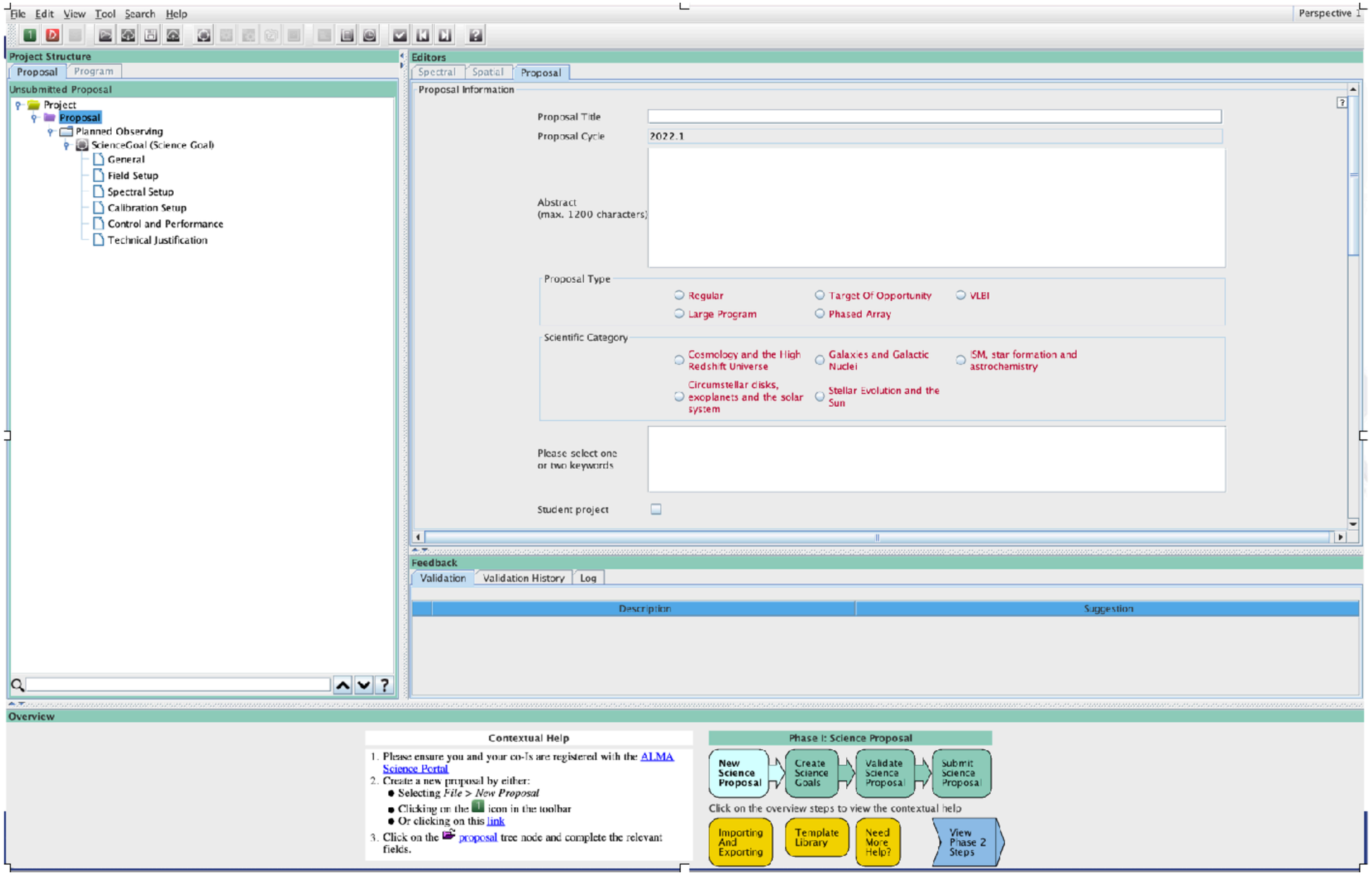
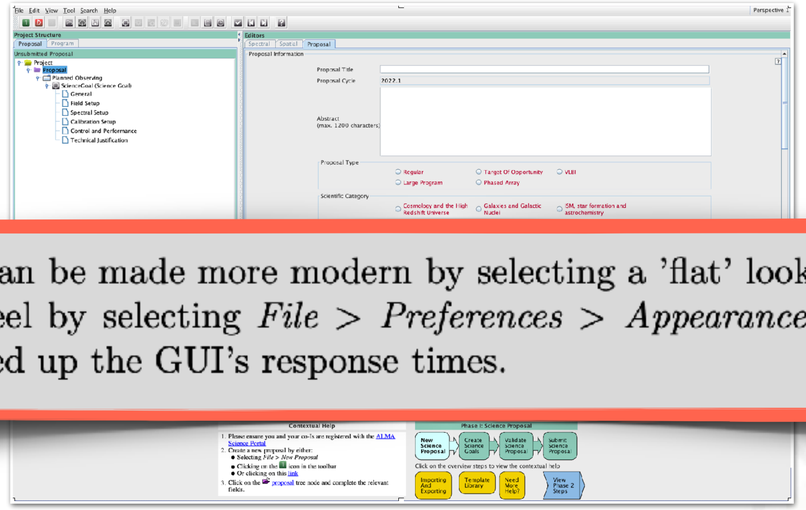
Starting the OT….

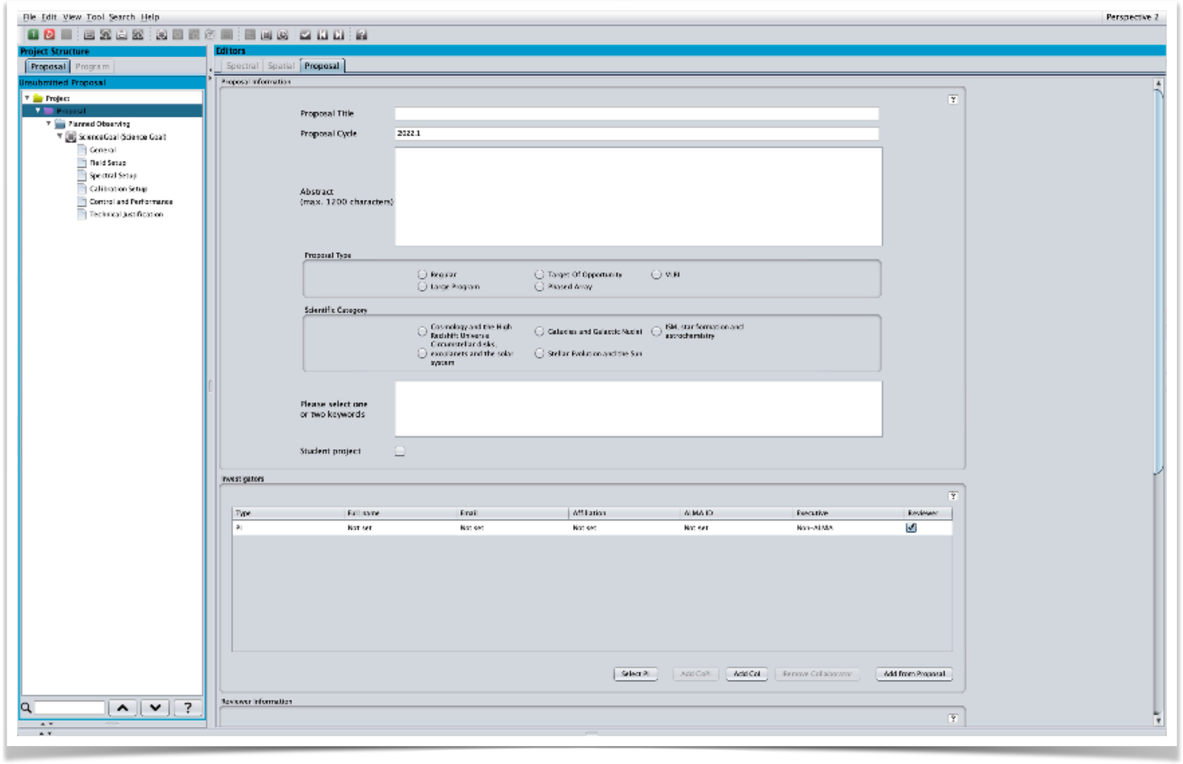


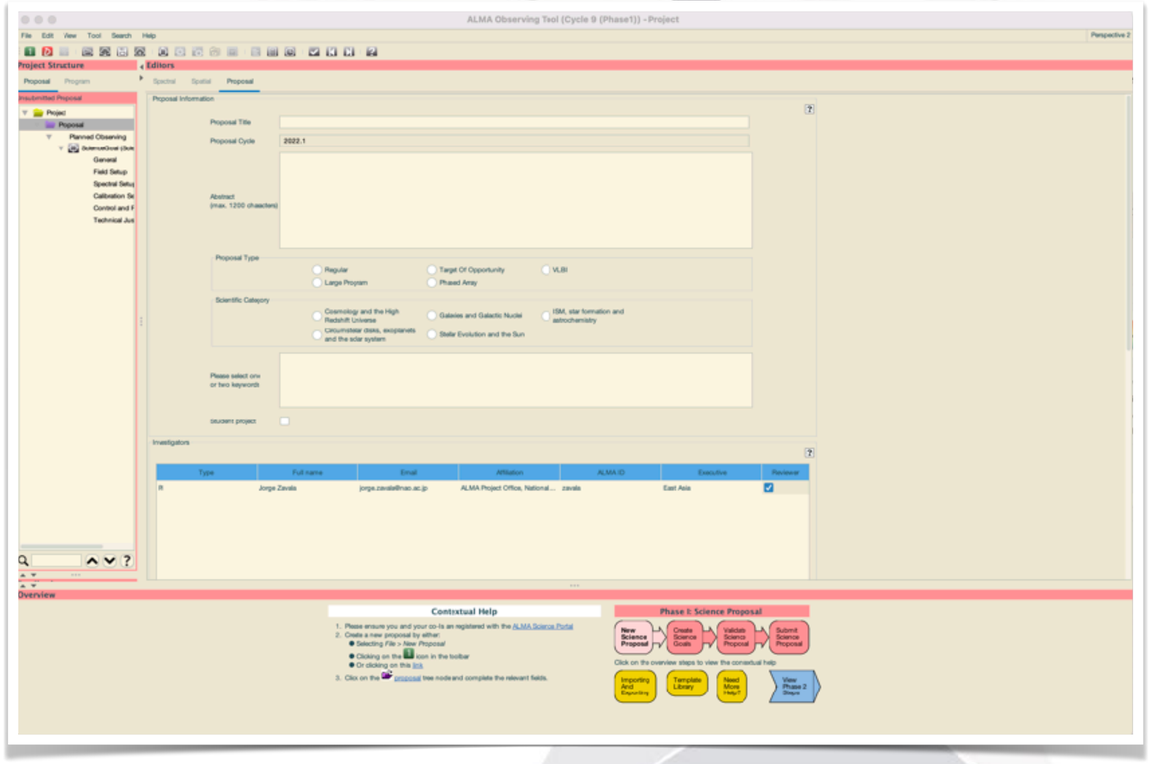
Preferences…



NEW

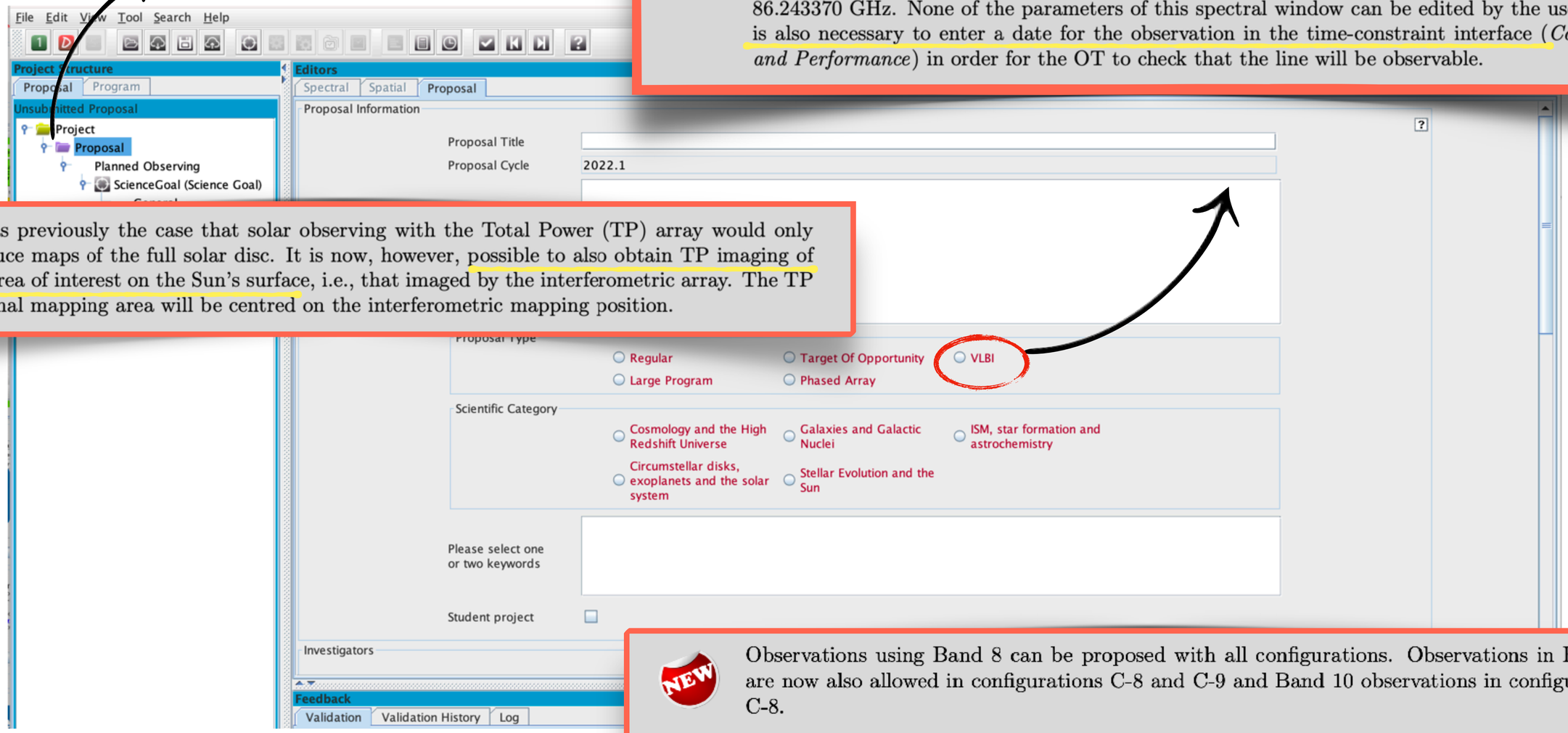
The OT GUI can be made more modern by selecting a 'flat' look and feel. You can customise the look and feel by selecting *File* > *Preferences* > *Appearance* > *Look and Feel*. This also appears to speed up the GUI's response times.





Proposal editor…

Create new Science Goal



NEW

It is now possible to select a predefined continuum setup in Band 7 – in addition to Band 3 and Band 6, that were already available – for VLBI proposals. VLBI spectral-line observing is now also allowed only in Band 3, even though this is significantly different to the standard ALMA case. The VLBI data are only taken in a single spectral window at a fixed sky frequency of 86.268 GHz, this being used to observe the SiO $v = 1(2-1)$ line with a rest frequency of 86.243370 GHz. None of the parameters of this spectral window can be edited by the user. It is also necessary to enter a date for the observation in the time-constraint interface (*Control and Performance*) in order for the OT to check that the line will be observable.

NEW

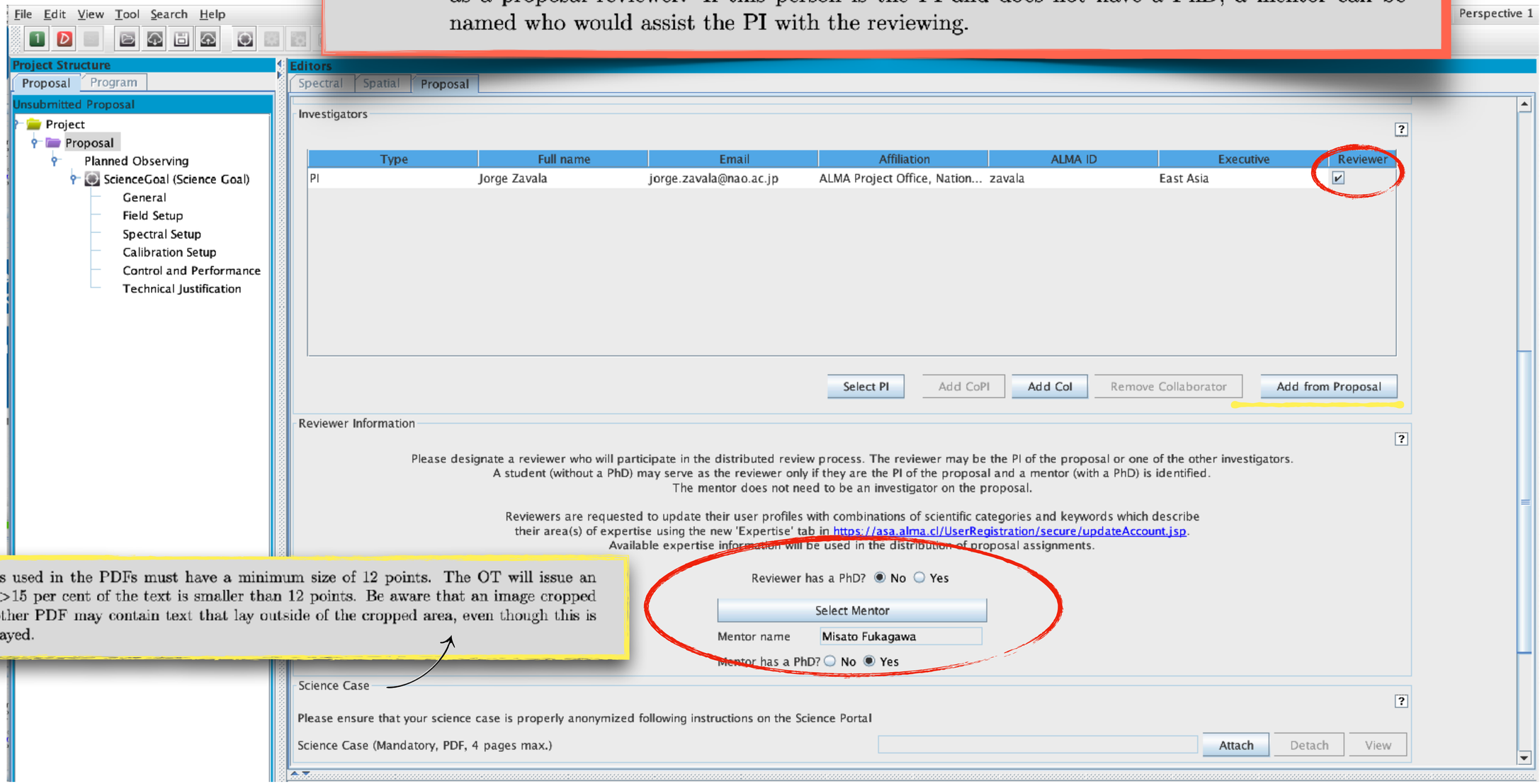
It was previously the case that solar observing with the Total Power (TP) array would only produce maps of the full solar disc. It is now, however, possible to also obtain TP imaging of the area of interest on the Sun's surface, i.e., that imaged by the interferometric array. The TP regional mapping area will be centred on the interferometric mapping position.

NEW

Observations using Band 8 can be proposed with all configurations. Observations in Band 9 are now also allowed in configurations C-8 and C-9 and Band 10 observations in configuration C-8.

Proposal editor…

Proposal review for proposals that are neither Larg Programs or ToOs, will now be done using distributed peer review i.e. the reviewing will be done by the PIs submitting such proposals. Unless Large Program is selected, the OT will require that one of the investigators be selected as a proposal reviewer. If this person is the PI and does not have a PhD, a mentor can be named who would assist the PI with the reviewing.



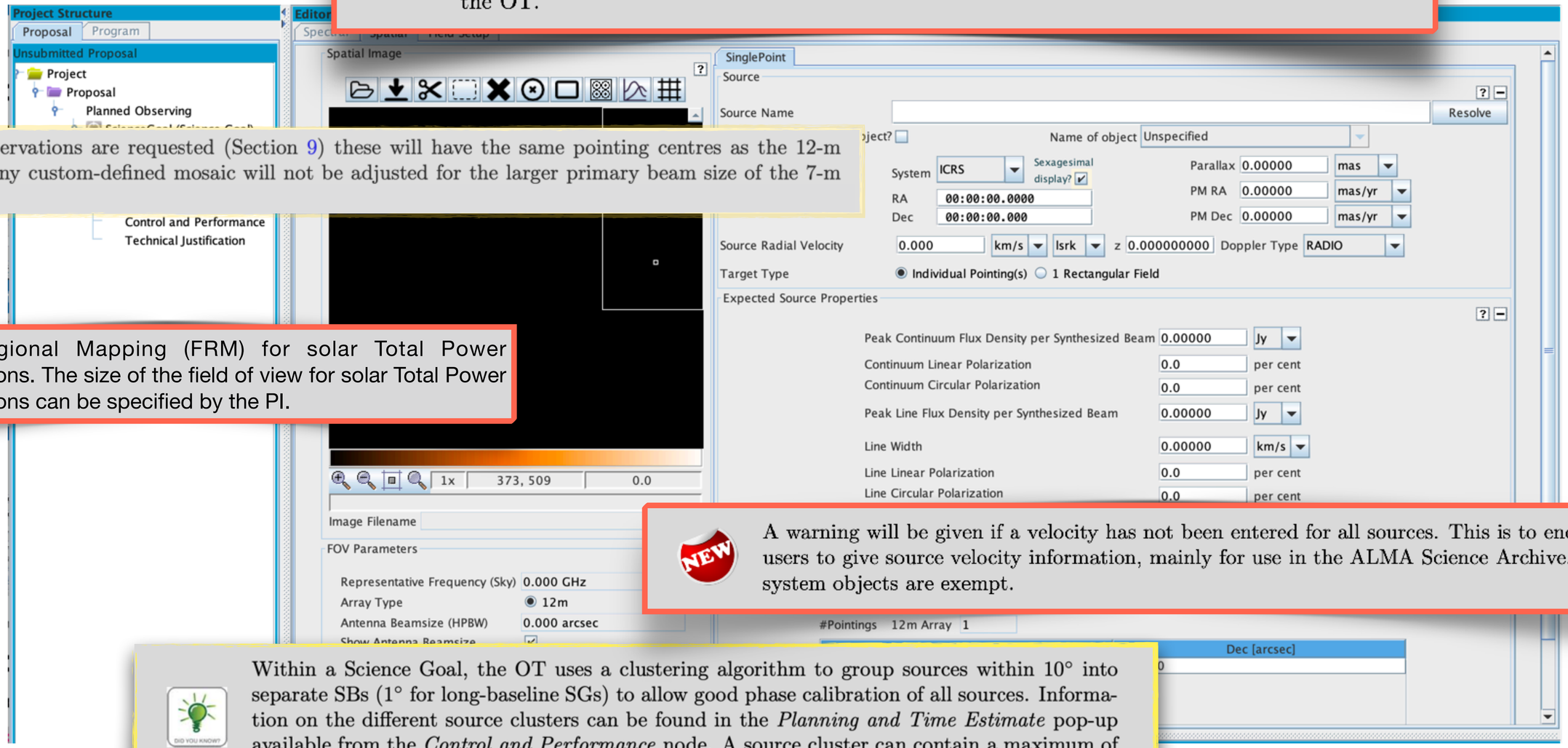
The fonts used in the PDFs must have a minimum size of 12 points. The OT will issue an **error** if >15 per cent of the text is smaller than 12 points. Be aware that an image cropped from another PDF may contain text that lay outside of the cropped area, even though this is not displayed.

Field setup…

Mosaics

The algorithm for tiling a rectangular area with mosaic pointings has been updated such that it is now possible to have an even number of pointings along a single row. In general, it is likely that there will be small differences in the number pointings compared to previous versions of the OT.

If ACA 7-m observations are requested (Section 9) these will have the same pointing centres as the 12-m pointings defined; any custom-defined mosaic will not be adjusted for the larger primary beam size of the 7-m antennas.



Fast Regional Mapping (FRM) for solar Total Power observations. The size of the field of view for solar Total Power observations can be specified by the PI.

A warning will be given if a velocity has not been entered for all sources. This is to encourage users to give source velocity information, mainly for use in the ALMA Science Archive. Solar-system objects are exempt.

Within a Science Goal, the OT uses a clustering algorithm to group sources within 10° into separate SBs (1° for long-baseline SGs) to allow good phase calibration of all sources. Information on the different source clusters can be found in the *Planning and Time Estimate* pop-up available from the *Control and Performance* node. A source cluster can contain a maximum of 150 pointings.

Spectral setup…

If you cannot find the transition you want in the Spectral Line Selector tool, try the *Search Online* button: you will then be able to search online from a more extensive database.

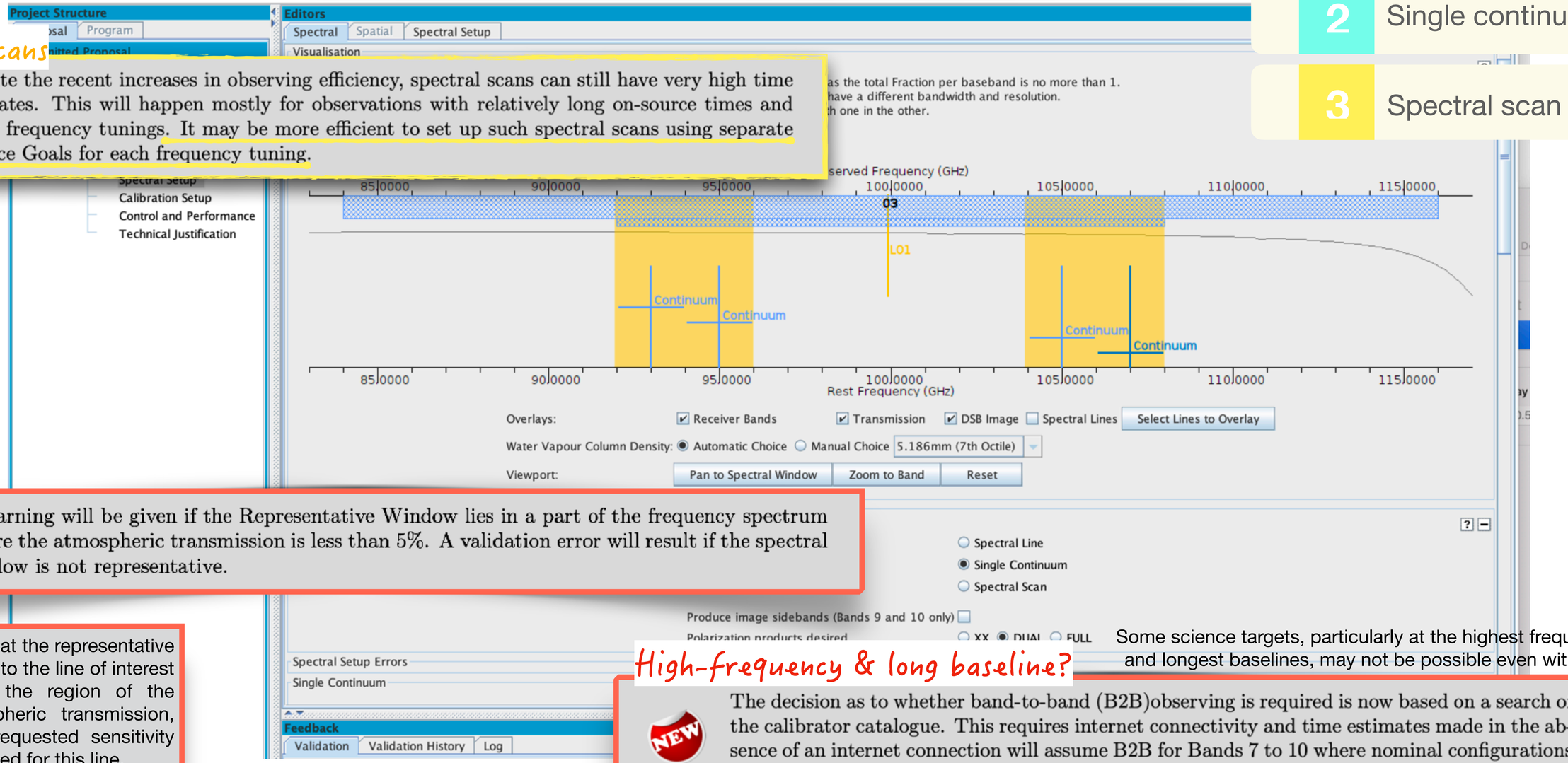
1 Spectral Line

2 Single continuum

3 Spectral scan

Spectral scans

Despite the recent increases in observing efficiency, spectral scans can still have very high time estimates. This will happen mostly for observations with relatively long on-source times and many frequency tunings. It may be more efficient to set up such spectral scans using separate Science Goals for each frequency tuning.



NEW

A warning will be given if the Representative Window lies in a part of the frequency spectrum where the atmospheric transmission is less than 5%. A validation error will result if the spectral window is not representative.

It is important that the representative frequency is set to the line of interest that falls into the region of the poorest atmospheric transmission, otherwise the requested sensitivity will not be reached for this line.

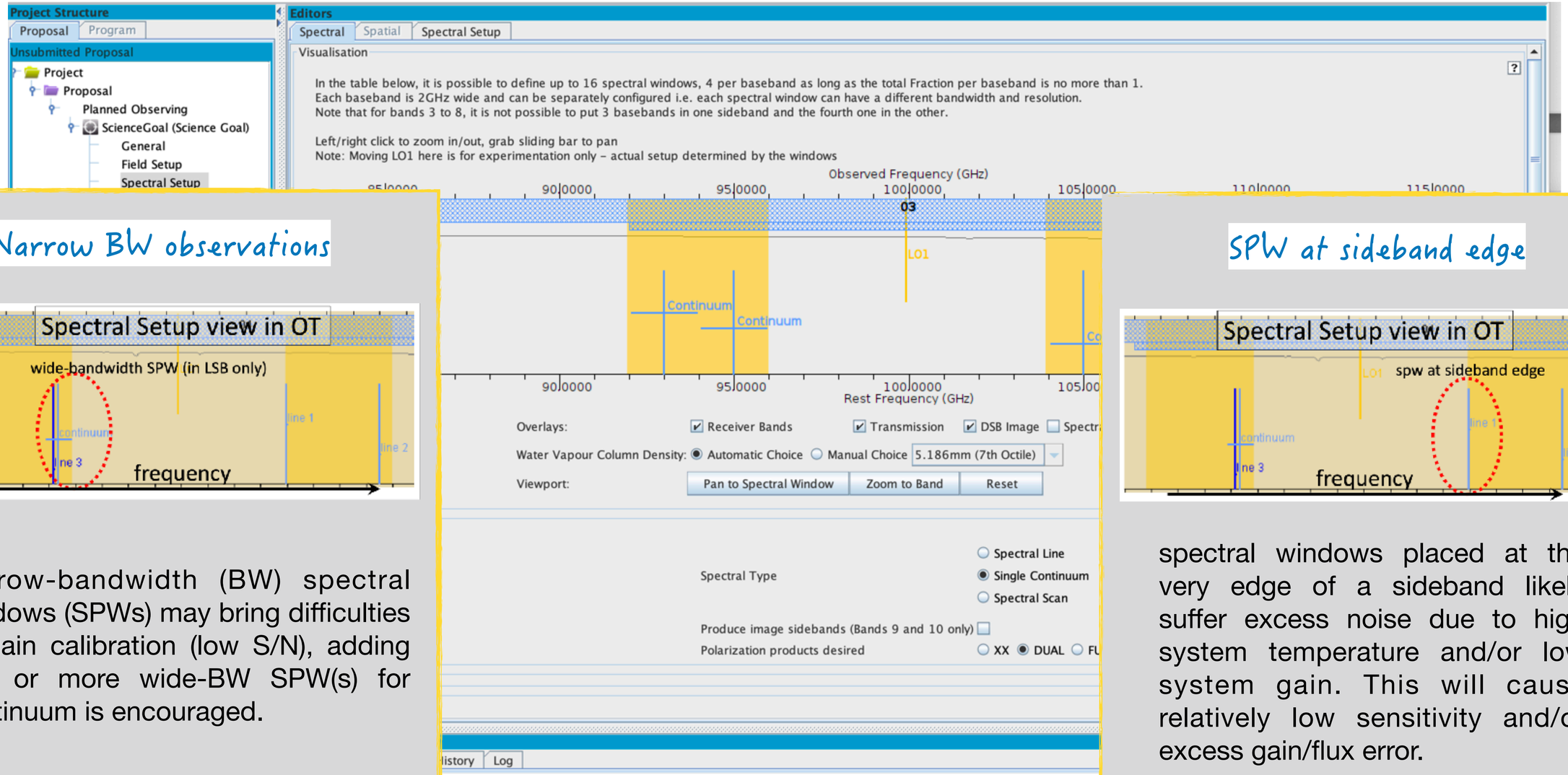
High-frequency & long baseline?

Some science targets, particularly at the highest frequencies and longest baselines, may not be possible even with B2B

NEW

The decision as to whether band-to-band (B2B)observing is required is now based on a search of the calibrator catalogue. This requires internet connectivity and time estimates made in the absence of an internet connection will assume B2B for Bands 7 to 10 where nominal configurations C-8 and larger are required.

Spectral setup…



Narrow BW observations

Narrow-bandwidth (BW) spectral windows (SPWs) may bring difficulties at gain calibration (low S/N), adding one or more wide-BW SPW(s) for continuum is encouraged.

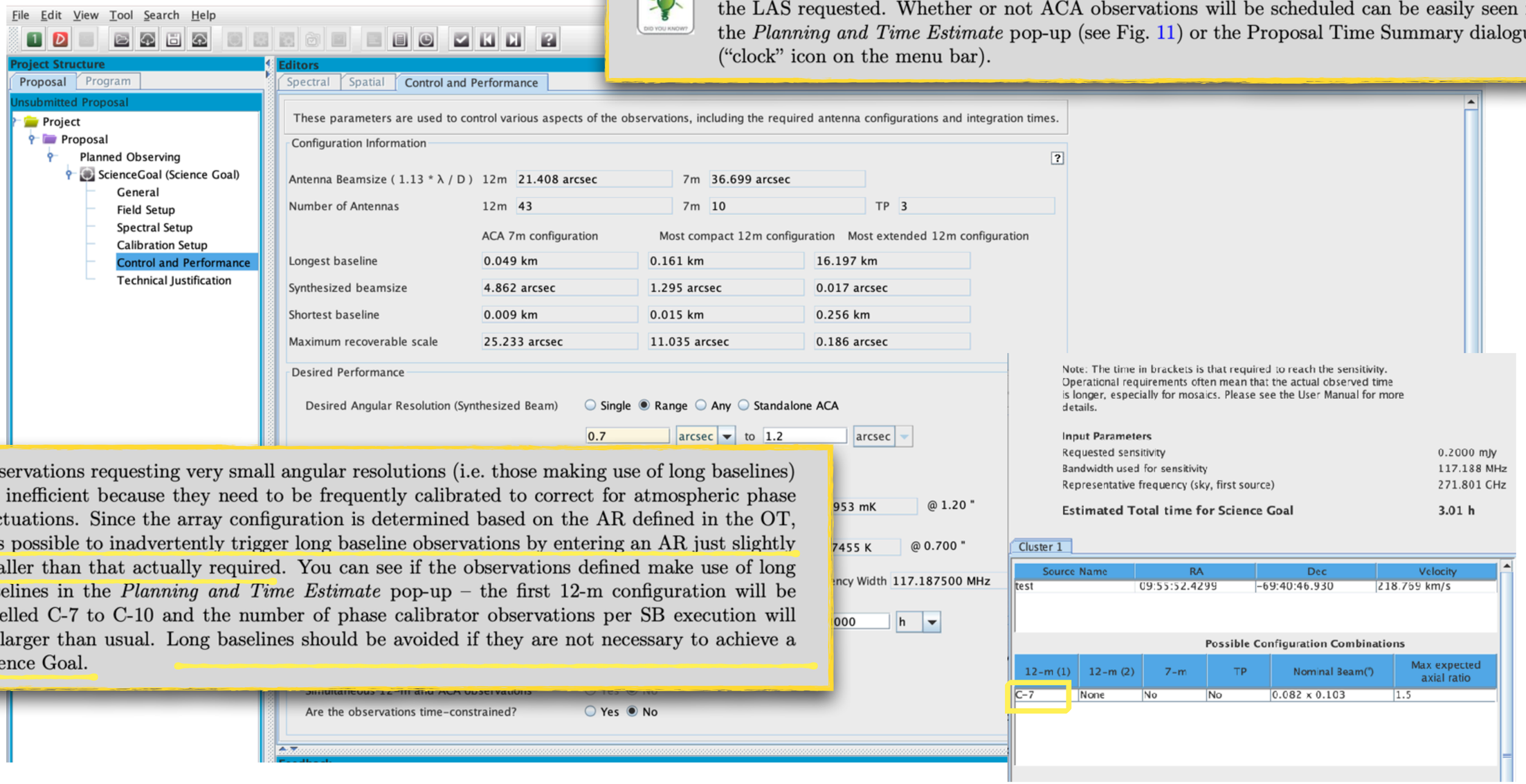
SPW at sideband edge

spectral windows placed at the very edge of a sideband likely suffer excess noise due to high system temperature and/or low system gain. This will cause relatively low sensitivity and/or excess gain/flux error.

See also Yu-Ting's talk!

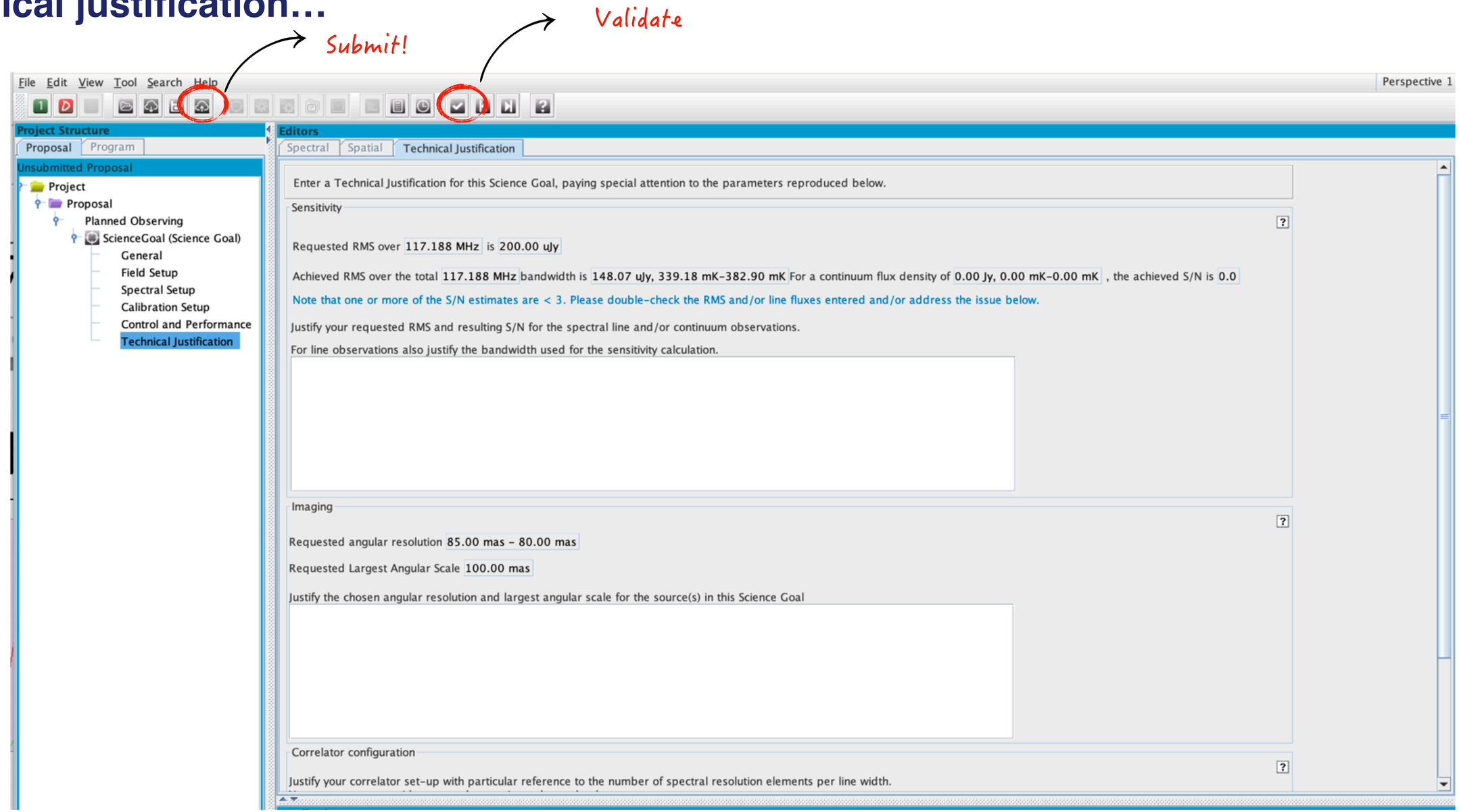
Control and performance…

Users do not directly select whether ACA 7-m and/or Total Power observations should be added to their 12-m observations or not. Instead, the ACA is imposed by the OT if required to achieve the LAS requested. Whether or not ACA observations will be scheduled can be easily seen in the *Planning and Time Estimate* pop-up (see Fig. 11) or the Proposal Time Summary dialogue ("clock" icon on the menu bar).



Observations requesting very small angular resolutions (i.e. those making use of long baselines) are inefficient because they need to be frequently calibrated to correct for atmospheric phase fluctuations. Since the array configuration is determined based on the AR defined in the OT, it is possible to inadvertently trigger long baseline observations by entering an AR just slightly smaller than that actually required. You can see if the observations defined make use of long baselines in the *Planning and Time Estimate* pop-up – the first 12-m configuration will be labelled C-7 to C-10 and the number of phase calibrator observations per SB execution will be larger than usual. Long baselines should be avoided if they are not necessary to achieve a Science Goal.

Technical justification…



Documentation…

QUESTIONS?

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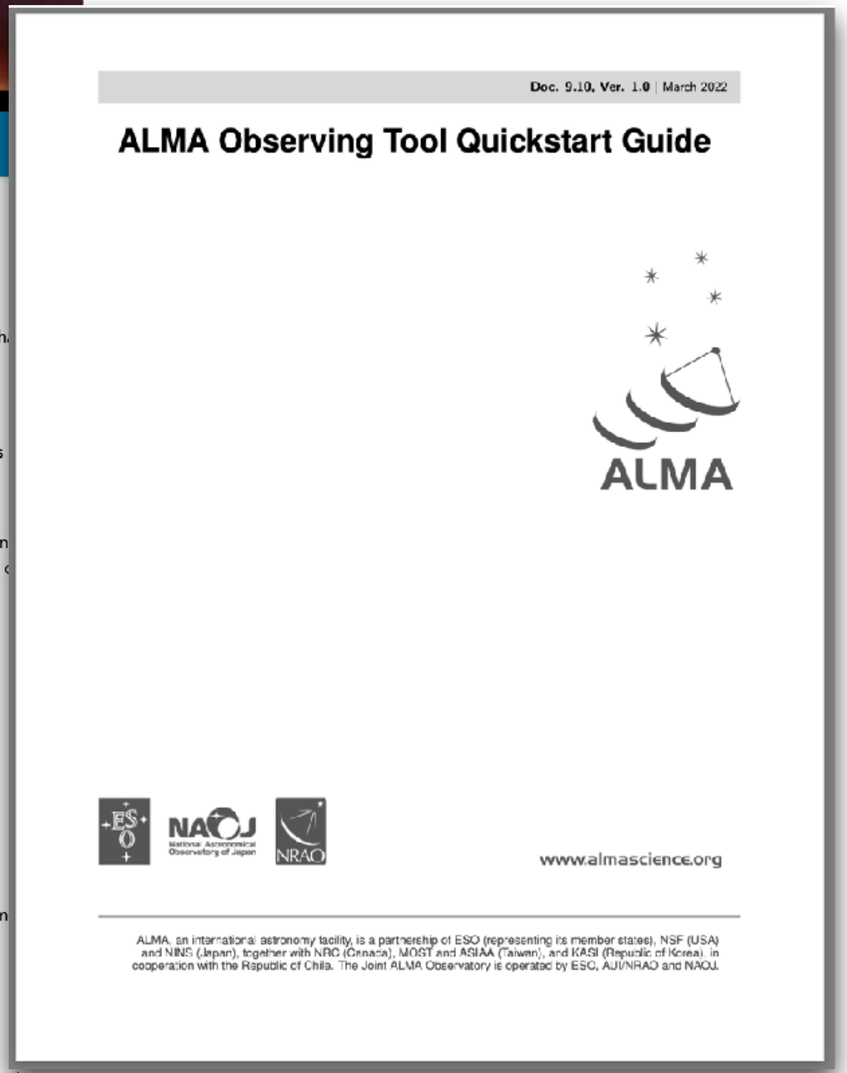

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ALMA Observing Tool Quickstart Guide

ALMA

www.almascience.org