



Should I put sources that require multiple tunings into different Science Goals?

Andy Biggs - 2023-11-01 - ALMA Observing Tool (OT)

In general, no, as putting all sources into a single Science Goal is much more convenient. The issue though with multiple tuning projects (multiple source redshifts or spectral scans) is that each tuning currently requires its own set of calibration observations which means that the time spent calibrating per SB increases linearly with the number of tunings. At the same time, as there is a maximum on-source time (measured over all tunings) per SB (50 minutes in most cases) the time spent observing each tuning decreases as a function of the number of tunings. These two factors combine to produce rather inefficient SBs that may require many repeats to achieve the requested sensitivity. The efficiency is particularly bad at Bands 9 and 10 or for the ACA where the time spent calibrating can be very large.

As a rule, if all the tunings can be observed in a single execution of an SB, then it is perfectly okay to leave all the tunings in the same Science Goal. If this is not the case, then it may be desirable to split the tunings into multiple Science Goals. However, it is often the case that the observatory will create more efficient SBs at Phase 2 and thus no work may be required by the PI.

Note that ALMA from Cycle 7 uses an updated observing strategy for spectral scans which improves the observing efficiency by up to 25%.