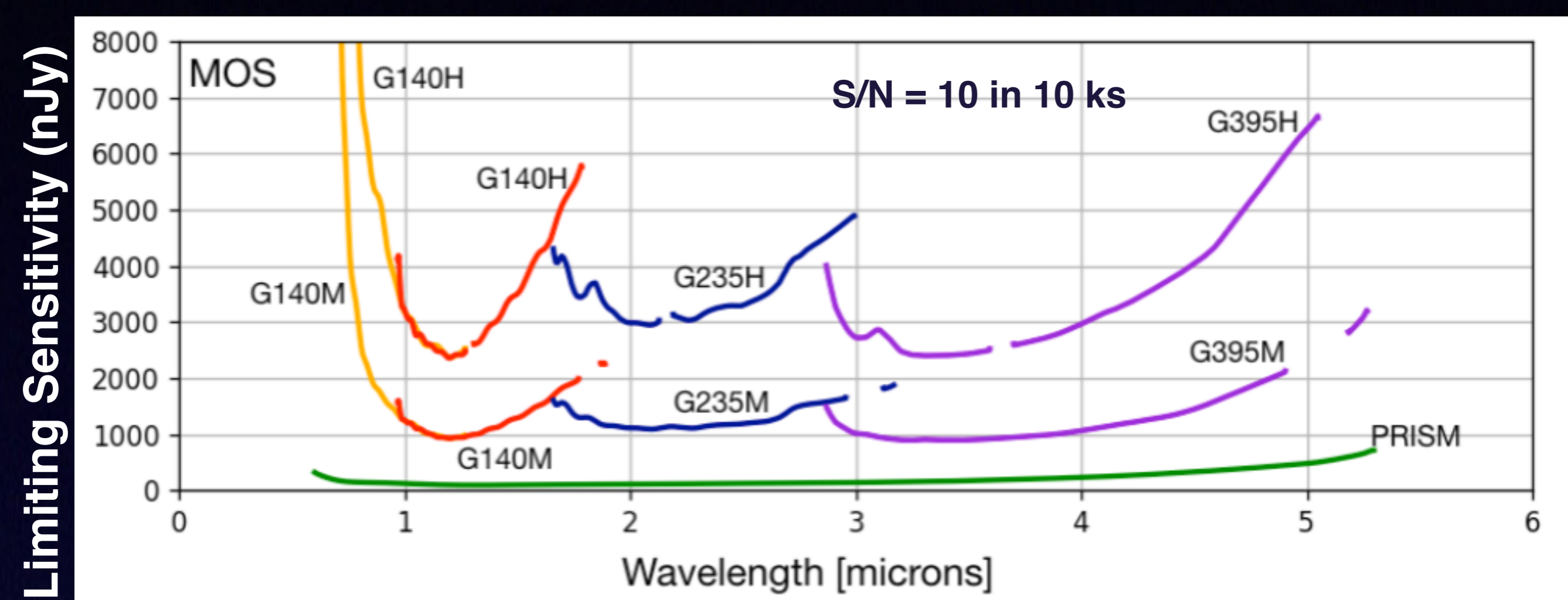


Alaina Henry, Diane Karakla, Tracy Beck

**Abstract:** Planning observations with NIRSpec's multi-object spectroscopy (MOS) mode is unlike any other JWST or HST proposal. In order to quantify overheads and multiplexing efficiency, proposers must create sample observations with the Microshutter Array (MSA) Planning Tool (MPT) within APT. Several considerations must be taken into account, as they can impact the proposed science. This poster highlights the key steps for writing a MOS proposal.

## 1. How much exposure time will I need?



from JWST pocket guide

### Consult the ETC! Some Tips:

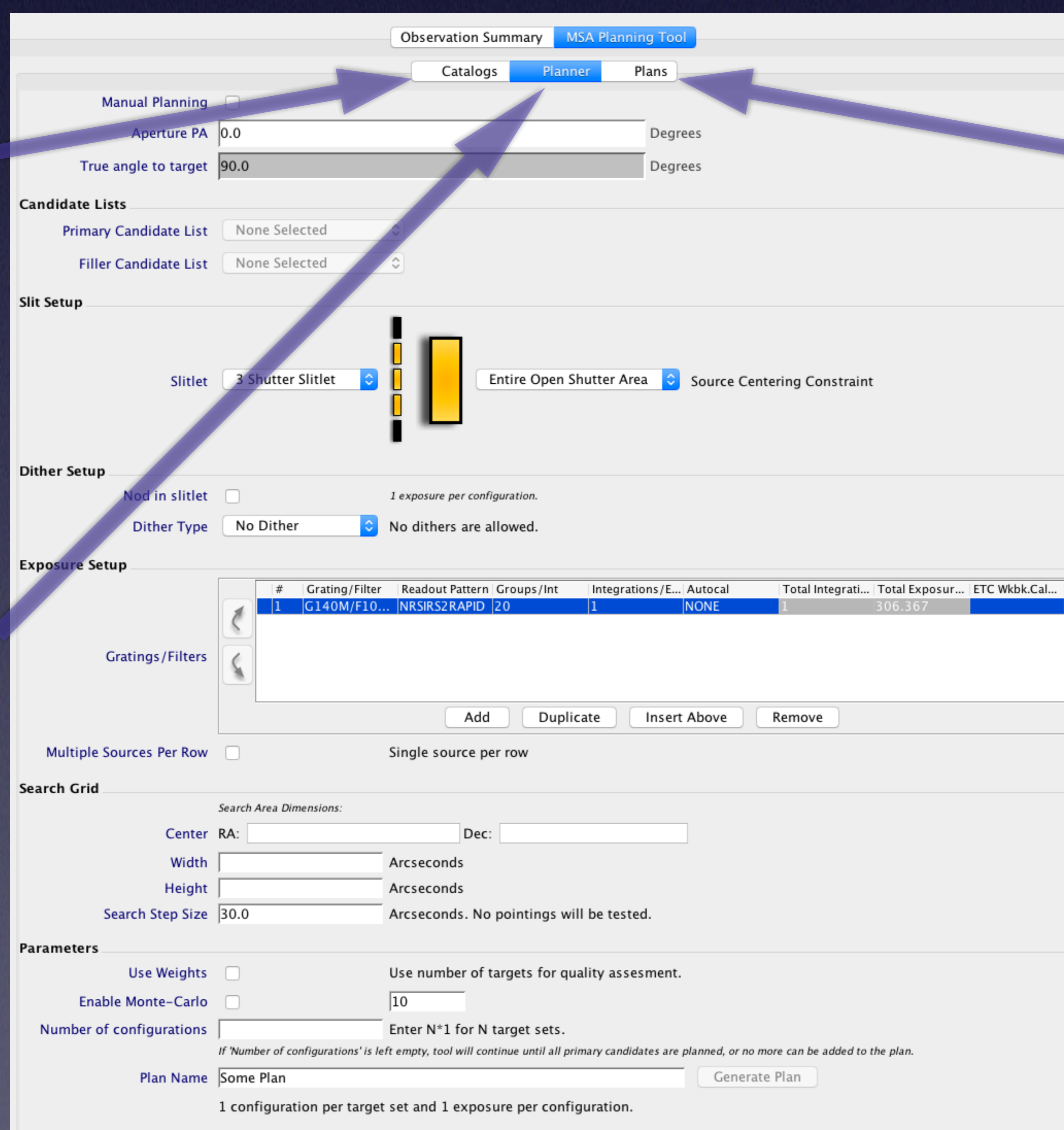
- The MSA shutters are 0.2" wide, and form a fixed grid. Slit losses can be significant, even for point sources, as they will not all be centered in the slitlets. This can be modeled in the ETC.
- Choosing more groups and fewer integrations yields lower read noise, and is recommended up to a maximum integration length of 1500 seconds.
- NIRSpec is detector limited, so signal-to-noise does **not** scale as the square root of exposure time.

## 2. MPT is the only way to know how many sources you will observe, and how long it will take.

Do not fill out the observation template directly, MPT will do it for you!

**A. Upload your catalog** on the Catalogs tab. HST or JWST astrometric accuracy is ideal, in order to ensure that targets are in 0.2" slits

**B. Make your design choices** on the Planner tab. Select Primary and Filler candidate lists, slitlet length, source centering constraints, exposure parameters, nods and dithers, and more! In place of this optimized approach, an interactive manual planner is also available.

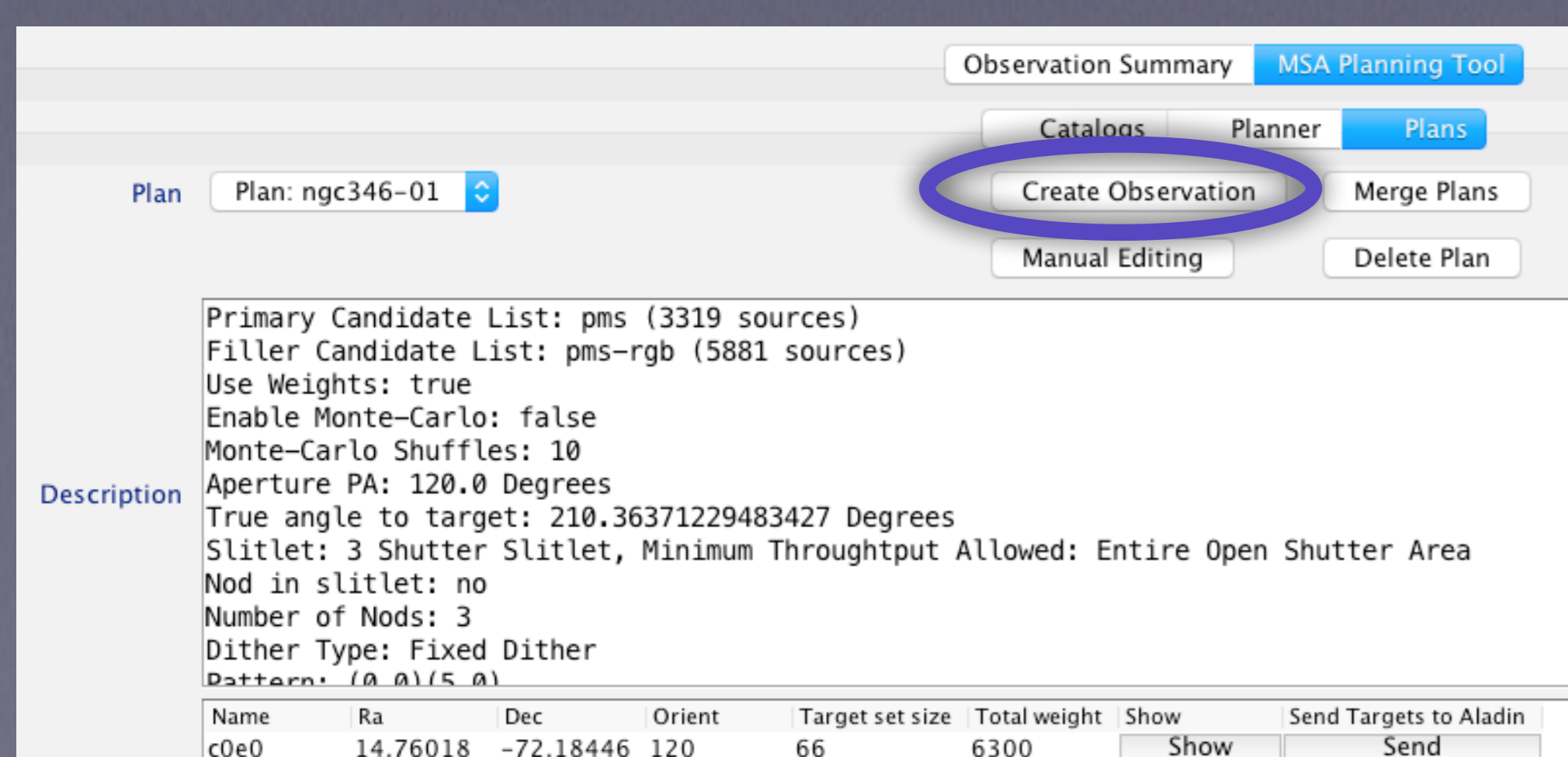


**C. Examine your plans on the Plans Tab.** Assess how many primary and filler sources are observed. MOS observing is statistical, and it is not expected that observations will target 100% of desired sources.

**D. Assess and iterate.**

- Consider science trade-offs between multiplexing efficiency and parameters such as source centering constraints and/or dithering.
- Test multiple position angles (since the angle will be assigned by STScI)
- Is depth vs. number of pointings optimal? If not, back to ETC.

## 3. Create the Observation with MPT and now write your Science Justification



- Create the observation to see the total time charged and to run the visit planner.
- PIs will update his placeholder observation and define target acquisition after the aperture position angle is assigned by STScI.
- **Start Early.** In moderately complex cases, iterating to choose the best representative MOS design (quantifying your sample size) can take days or longer for experienced MPT users.

## 4. More information

- JDox: For guides to MPT, MOS process, the NIRSpec instrument, and much, much more! [jwst-docs.stsci.edu](http://jwst-docs.stsci.edu)
- Exposure Time calculator: [jwst.etc.stsci.edu/](http://jwst.etc.stsci.edu/)
- Ask us at the Help Desk! [jwsthelp.stsci.edu](http://jwsthelp.stsci.edu)