

JWST Science Parallel Observation Policies and Guidelines

JWST science parallel observations aim to maximize the science return of JWST by obtaining data from multiple [JWST instruments](#) simultaneously. Parallel observations can be implemented in two modes: Coordinated Parallels, where both prime and parallel observations are part of the same program with a single Principal Investigator (PI); and Pure Parallels, where the prime and parallel observations are separate programs with separate PIs.

Introduction

This report describes the policies that will be employed by Space Telescope Science Institute (STScI) in implementing science parallel observations with the James Webb Space Telescope (JWST). Science parallel observations aim to maximize the scientific return from JWST by operating multiple instruments simultaneously. Parallel observations can be implemented in two modes: Coordinated Parallels, where both prime and parallel observations are part of the same program with a single Principal Investigator (PI); and Pure Parallels, where the prime and parallel observations are separate programs with separate PIs. All parallel observations are subject to scientific review; parallel observations proposed as both General Observer (GO) and Guaranteed Time Observer (GTO) programs must receive explicit approval from the STScI Director. The expected audiences for this report are the members of the GO and GTO community, the STScI Proposal Planning and Scheduling team and the STScI Webb Instrument Team. Other STScI teams may find this report useful in optimizing the design of their components of the JWST system.

The JWST scientific instruments lie in fixed positions within a common focal plane. It is therefore possible to increase the scientific productivity of JWST by conducting observations simultaneously with one or more instruments *in addition* to the primary instrument. Those additional observations are called *parallel* observations. Parallel observations have been possible with only one previous NASA Great Observatory, the Hubble Space Telescope (HST). The policies and procedures outlined in this document are based on the experience gained and are modeled closely on those adopted for HST.

Each instrument samples a different portion of the JWST focal plane. An instrument used in parallel mode will normally be pointed at a “random” area of sky several minutes of arc from the primary target. Consequently, parallel observations are usually of a survey nature. However, many targets lie within extended objects such as star clusters or galaxies, rendering it possible to conduct parallel observations of nearby portions, or even specific targets, within these objects.

Depending on whether a parallel observation is related to a specific primary observation, it is defined as either a *Coordinated Parallel* or a *Pure Parallel*. Coordinated Parallels are related to a particular primary observation in the same proposal. Pure Parallels are unrelated to any particular primary observations (i.e. the primary observation is in another program).

Parallel observations are rarely permitted to interfere significantly with primary observations; this restriction applies both to concurrent and subsequent observations. Specifically:

- A pure parallel observation cannot dictate how the primary observation will be structured (e.g. it cannot cause the adjustment of primary exposures). The definition of the parallel observation is independent of and subordinate to a primary observation.
- Parallel observations will not be made if the stored command capacity or data volume limits would be exceeded.
- Pure Parallel observations may not explicitly constrain the scheduling of the primary observations; that is, they may not specify orientations or timing constraints.
- Coordinated Parallel observations may include orientation or timing constraints as requested and justified in the accepted JWST proposal.
- Pure Parallel observations are subject to the availability of parallel observing opportunities as identified by STScI.

The policies and procedures described here apply to both GO and GTO programs.

Coordinated Parallel Observations

Coordinated Parallels use one or more instruments in addition to and simultaneously with the primary instrument in the same proposal e.g. to observe several adjacent targets or regions within an extended object. Proposal that include Coordinated Parallel observations must provide a scientific justification for and description of the parallel observations. It should be clearly indicated whether the parallel observations are essential to the interpretation of the primary observations or the science program as a whole, or whether they address partly or completely unrelated science goals. The proposal must also address the reduction and analysis of the parallel observations, including the priorities assigned to those activities and the expertise available in the proposal team. GO Coordinated Parallel observations are subject to scientific review by the Telescope Allocation Committee (TAC) and must be approved by the STScI Director; all GTO Coordinated Parallel observations are subject to scientific review by the STScI Director, working in coordination with the NASA Headquarters JWST Program Scientist. Parallel observations can be rejected even if the primary observations are approved.

Proposers are generally not allowed to add Coordinated Parallel observations that were not explicitly included and approved as part of the initial proposal submission. Any such requests will be adjudicated by the Telescope Time Review Board (TTRB).

Coordinated Parallel observations will ordinarily be given the same exclusive access period as their associated primary observations.

Pure Parallel Observations

The Pure Parallel observing process is designed to take advantage of the full complement of instruments available on JWST. Similar to primary science planning, STScI will provide an estimate, in advance of observations, of the number of hours that are likely to be available to accepted parallel programs during the upcoming cycle. GO and GTO primary observations without associated Coordinated Parallels will generally be available for scheduling Pure Parallel observations; in some cases, the constraints of the primary observations may not be compatible with supporting parallel observations.

Restrictions

Pure Parallel observations can be proposed for scheduling with any primary instrument on JWST. Proposals are limited to operating one instrument in parallel mode: i.e. parallel observations can be proposed using either [NIRSpec](#) or [NIRCam](#) or [MIRI](#) or [NIRISS](#), but cannot be proposed for any combination of those instruments. Pure Parallel programs must specify a minimum total on-target time for the primary observations (details on that are in [this article](#)).

Review and Execution

Pure Parallel programs are GO programs that must be submitted in response to the annual JWST Call for Proposals. The review panels and the TAC will select Pure Parallel science. The TAC will consider all accepted programs and produce a ranked list as an aid for resolving potential conflicts. All GO Pure Parallel Programs will be non-proprietary, with no exclusive access period by default. Proposers may request an exclusive access period; that request is subject to review by the TAC. Pure Parallel observations are assigned to specific primary observations, and the parallel observations will be carried over to subsequent cycles if the primary observations are not executed in the upcoming cycle.

Subsequent to the JWST TAC review, PIs with accepted Pure Parallel Programs will be given a list of parallel science opportunities that STScI has identified as being suitable for their program. The PI then selects and submits a final list of observing opportunities to STScI; the Pure Parallel observations will be matched to the primary observations during the planning and implementation phase. Proposals for Pure Parallel observations may specify either particular or generic targets, although the latter are more common and provide more flexibility for matching parallel observations to actual opportunities.

Parallel Observations in Early Cycles

The [Astronomer's Proposal Tool](#) will provide observing templates for Coordinated Parallel observations for a subset of instrument combinations in Cycle 1, with additional templates becoming available in subsequent cycles. Those templates will allow proposers to develop detailed observing schemes that optimize the observations obtained with both instruments e.g. dithering patterns will be available that optimize the spatial sampling on both detectors.

GO and GTO proposers may propose for Coordinated Parallels only if the specific instrument/mode combination is allowed in the Call for Proposals for that particular cycle.

In Cycle 1 both Coordinated Parallel programs and Pure Parallel programs are limited to using no more than two instruments i.e. Coordinated Parallel observing proposals may request observations with a single primary and a single parallel instrument; Pure Parallel proposals may request observations with only a single instrument.

All Pure and Coordinated Parallel observations must be approved by the STScI Director.

Related links

[JWST Cycle 1 Proposal Opportunities](#)

[JWST Astronomers Proposal Tool Overview](#)

[Astronomer's Proposal Tool](#)

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